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**REVIEW OF NEW BOOKS.**  
*Refutation of the Mistakes and Calumnies contained in Mr. Lockhart's Life of Sir Walter Scott, Bart., respecting the Messrs. Ballantyne.* By the Trustees and Son of the late Mr. James Ballantyne. 8vo, pp. 88. London, 1838. Longman and Co.; Edinburgh, Black.

In the course of our two and twenty years' labours, we have not met with any publication which has given us so much pain to notice as the present; which yet involves questions of so much general and literary interest, that we cannot shirk our duty and avoid its consideration. All the parties, the dead and the living, have been, and are, intimately known to us; with some our regards and affections have been interchanged in the warmest manner; and with most of the points in the grievous discussion we are personally and familiarly acquainted. When the earlier volumes of Mr. Lockhart's biography of Sir Walter Scott appeared, we could not help expressing deep regret at many of the statements they contained; statements, in our opinion, injurious to the memory of that great man, and equally, if not more deeply, injurious to others with whom he had spent his life in the closest intercourse of worldly business, and apparently more than worldly friendship. In winding up the memoirs of his illustrious relative, and describing the glorious struggle of his last years, Mr. Lockhart had the opportunity, which he has embraced with such powerful talent, to wipe out the unfavourable impressions which the preceding details had made, as they affected his character. But, if the same opportunity offered to do justice to others, and especially to the Ballantyne family, and redeem them from the obloquy of the first representations, Mr. Lockhart, unfortunately as we think, either did not avail himself of them, or did not believe any sufficient reparation called for; for we look upon as nothing the few casual words of regret and explanation which he has finally bestowed upon the subject.

Scott was giant enough not to need the sacrifice of his attached friends on the altar of his greatness; and it does seem to us to be a cruel injustice to have not merely diminished but defamed James and John Ballantyne in order to eke out the measure of his colossal stature. A worthier and a warmer hearted man than James Ballantyne never existed; nor a man of more honourable integrity, combined with the kindest sentiments and feelings of humanity. John, too, with all his vivacity, his song, his anecdote, his repartee, his fun, and his tale (in the latter of which he was Mathews's teacher), merited not the title of picaroon, except in the spirit of jocular intimacy, which converts terms of reproach into terms of endearment, and renders it a deep sin against society to repeat such expressions as if ever they had been meant in serious application.

With these brief and unwilling remarks we turn to the defence before us, in which the filial piety of a Ballantyne (John, the not unworthy son of James), assisted by family and other friends, has warmly and powerfully vin-

dicated the fame of a father and the reputation of other near relatives. It is in form the same as the volumes whose truth and accuracy it impeaches; and can thus be conveniently bound up with them: and, indeed, it ought so to be preserved, for it throws much light upon very prominent portions of their contents. It is generally and well observed:—

"In the 'Life of Sir Walter Scott' it did not, it seems, occur to Mr. Lockhart that the representations he has given of his father-in-law's dearest friends and most constant allies might lead honest people to inquire how, if these men were really such doubtful or ambiguous characters—gluttons or picaroons—as they have been described by him, a gifted being like Scott, who to high genius united great worldly discernment and sagacity, came to associate with and confide in them throughout every vicissitude of fortune, in cloud as well as in sunshine, in storm as well as in calm? A question so natural and so germane to the subject (as treated by Mr. Lockhart) not having been anticipated by him, no solution had been provided for the unforeseen interrogatory. But, when reflection had shewn that it might be convenient to obviate an objection which must present itself to every mind, means were immediately used to supply the omission; and we have now before us the 'Standard' newspaper, of the 2d April, 1838, in which, under cover of some general remarks on the 'Life of Sir Walter Scott,' an attempt is made to forestall the anticipated objection; and, in order to give greater prominence to the volunteer defence, the ordinary 'leader' of the paper is displaced to make room for it. The writer of the article in question, after telling us that 'Sir Walter Scott was the greatest man that has lived in our generation,' and that 'he was the wisest man of his own and of many ages,' proceeds to throw a little shade into his picture, by way of enhancing the ultimate effects:—'He had weaknesses, but they were the effect of a lofty and modest nature; he was indiscreet in the selection of associates, from generous confidence and a too much expanded benevolence. We speak with much deference, but we must, nevertheless, be permitted to observe, that a tendency to herd with improper associates appears to us to be strange effect of a generous and modest nature; one, indeed, which we should never have *a priori* anticipated from our own knowledge of human nature. And, on the other hand, with regard to the assertion that Sir Walter Scott's alleged indiscretion 'in the selection of associates' arose 'from generous confidence and a too much expanded benevolence,' we shall, in the sequel, be under the necessity of testing the value of this rhetoric by a species of logic (that of figures) to which Mr. Lockhart seems to be, in a great measure, a stranger."

These remarks follow upon the assertion that,—

"Mr. Lockhart endeavours, throughout the whole of his work, to aggrandise the character of Sir Walter Scott by depreciating that of the friends whom he most esteemed and trusted; and seeks to exonerate him from all blame connected with the misfortunes which ruined them

all, by insinuating every sort of misdeed or negligence against his associates."

The pamphlet points out that in his sketch of the early life of John Ballantyne, the writer is completely wrong in almost every particular; and thence demonstrates the tendency to error in other material statements in which the character of the Ballantynes are implicated.

"The foregoing piece of personal history (says our Refutation) is followed by a gross and libellous caricature of the two brothers. The one is described as a gourmand; the other is represented as something worse. Scott, it is said, used to apply to them certain grotesque nicknames, which Mr. Lockhart, with his characteristic taste and feeling, has published. But still they had some merit, even in the eyes of the man who has so cruelly aspersed their memories. 'They entertained him (Scott); they both loved and revered him, and I believe would have shed their hearts' blood in his service; but they both, as men of affairs, deeply injured him—and above all, the day that brought John into pecuniary connexion with him, was the blackest in his calendar. A more reckless, thoughtless, improvident adventurer never rushed into the serious responsibilities of business.' It was certainly something to entertain Scott; it was more 'to love and revere him'; and it was most of all that Mr. Lockhart 'believes' they 'would have shed their hearts' blood in his service.' But even these singular and, as we should think, redeeming virtues, were, it seems, overbalanced, if not extinguished, by the consideration that 'both, as men of affairs, deeply injured him'; and, above all, that 'the day which brought John into pecuniary connexion with him was the blackest in his calendar.' Now, we shall prove that these assertions are contradicted by the evidence of Sir Walter, as quoted by Mr. Lockhart himself; that, so far from his having been 'deeply injured' by his connexion with the Ballantynes, he was thereby greatly benefited; that his own large expenditure absorbed the whole profits of the printing establishment, and much more besides, involving the elder brother in ruin at a period of life when, from the nature and extent of his business, he might otherwise have possessed a comfortable, if not an affluent independence; and that the day which brought John Ballantyne into pecuniary connexion with Scott, and which Mr. Lockhart styles 'the blackest in his calendar,' was eventually productive of no greater calamity to Sir Walter than replacing in full his advances on the book-selling business, 'with balance of thousand pounds,' notwithstanding the most imprudent undertakings in which he had embarked. All these circumstances will fall under our review in the sequel, where, eschewing the example of Mr. Lockhart, we shall endeavour to make our statements square with our proofs, leaving it to others to draw upon their imagination, which is at all times an easier matter than to submit to the drudgery of examining facts. In the meantime, as he tells us 'a more reckless, thoughtless, and improvident adventurer' than John Ballantyne 'never rushed into the serious responsibilities of business'; and as he even

insinuates that his integrity was by no means of a kind to be relied upon, we shall take leave to oppose to the damnable statements and innuendoes of Mr. Lockhart the decisive evidence of Sir Walter Scott, even when writing in a moment of irritation and displeasure. In a letter, dated the 18th of May, 1813, addressed to Mr. John Ballantyne, Sir Walter, in conclusion, says, — ‘Adieu, my dear John. I have the most sincere regard for you, and you may depend on my considering your interest with quite as much attention as my own. If I have ever expressed myself with irritation in speaking of this business [the disposal from the stock of John Ballantyne and Co. to Constable's firm of certain unsaleable books and copyrights], you must impute it to the sudden, extensive, and unexpected embarrassments in which I found myself involved all at once. If to your real goodness of heart and integrity, and to the quickness and acuteness of your talents, you added habits of more universal circumspection, and, above all, the courage to tell disagreeable truths to those you hold in regard, I pronounce that the world never held such a man of business. These it must be your study to add to your other good qualities.’

Again, “‘The alliance with Ballantyne,’ says he, ‘soon infected him (Scott) with the proverbial rashness of mere-mercantile adventure;’ and ‘hence,’ he adds, in conclusion, ‘by degrees was woven a web of entanglement, from which neither Ballantyne nor his adviser had any means of escape.’ Doubtless, ‘a web of entanglement’ was woven, but certainly not from ‘the rashness of mere mercantile adventure.’ The profits of the printing concern were at that time twice as large as those that are generally derived from this business nowadays; and if they had been applied to their legitimate purpose, they would have soon unwoven the meshes of any ‘entanglement’ proper to the business. It is true, that the rashness of Scott's literary schemes,—the extreme imprudence of which his biographer has not attempted to disguise,—must have considerably embarrassed both himself and his partner; but even these were not the cause of Scott's ultimate ‘entanglements,’ as Mr. Lockhart asserts in a subsequent part of the work; the business of the printing-house having been ample enough to conquer all the difficulties which sprang from that source. Neither was the unfortunate bookselling business, — ‘begun,’ as Mr. Lockhart most truly says, ‘in the short-sighted heat of pique, and conducted with the extravagant folly of a raw speculator in the perilous trade of publishing,’ — in any way the cause of the embarrassments in which Sir Walter Scott became eventually involved. Even although it had, his biographer would not have been entitled to complain; for it was entirely of Scott's own seeking. That concern was established to meet his own views at the time; he having a one-half share,\* and James and John Ballantyne one-fourth share each, with a salary to the latter as manager. But, although the difficulties arising from the bookselling concern were troublesome at the time, they were not lasting. John Ballantyne, in his ‘Memorandum’ — which Mr. Lockhart quotes, but does not condescend to inform us how or by what means it chanced to come into his hands — attributes them in part to

‘the most extravagant and foolish advances from its funds to the printing concern;’ in other words, to the paying the accounts due for printing the ‘unpromising’ literary adventures in which Scott rashly embarked, and which have been pretty correctly enumerated by Mr. Lockhart himself. But even the bad stock — and none could possibly be worse — accumulated in consequence of those rash and ill-judged speculations, was, in the end, disposed of upon advantageous terms; the house met all its engagements; and Sir Walter, who ultimately became the sole creditor, ‘paid even himself in full, with a balance of a thousand pounds.’ What then, it has justly been asked, ‘becomes of the ruin which John Ballantyne had entailed upon Sir Walter, if, after all the wild speculations in which Scott had involved the young and starved concern, he was paid in full, and a thousand pounds more?’ To every reader of Mr. Lockhart's work it must be as clear as noonday, that Sir Walter Scott's embarrassments did not spring from his connexion with the Ballantynes, either as printers or booksellers; but originated solely in his ambition to become a landed proprietor, and to ‘endow a family’ before he had acquired the means of effecting either upon any sound or secure foundation. And it is equally evident that Mr. James Ballantyne was eventually ruined by Sir Walter Scott; — rendered penniless at a time when he ought to have been able, if so inclined, to retire with a handsome competence. If Sir Walter Scott had never been connected with James Ballantyne in business, but had contented himself with extending his patronage to his old schoolfellow, it would have been infinitely better for both parties. Mr. Ballantyne would, in that case, have realised a respectable fortune; and Sir Walter would have escaped the temptations presented by the facilities of a mercantile copartnership, to raise money for the purchase of lands for which he had not otherwise the means of paying. Sir Walter Scott's embarrassments, and the consequent embarrassment and ruin of his partner, arose, as we have just stated, from his extensive purchases of land before he had realised money to pay for it; and from his making a free use of the name of the company (with the consent of his partner, of course) to meet the payments for these purchases, — a proceeding which led to a series of bill transactions with Constable and Company, which, on the failure of that firm, brought ruin both on himself and on Mr. James Ballantyne. Money wanted was raised, first, by acceptances to James Ballantyne and Co., for a portion of the amount required; and, secondly, by obtaining from Constable and Co., as if for literary property, promissory-notes or acceptances for a further portion: for these James Ballantyne and Co. granted acceptances to Constable and Co.; and the remaining portion was raised by James Ballantyne and Co. drawing bills on Constable and Co., and granting acceptances in return; — Sir Walter Scott, the sole party for whom these extensive accommodations were arranged, remaining all the while in the back-ground, unseen and unnamed. Whatever accommodation the printing concern may, at one period, have obtained from Constable and Co., the passion for land came speedily to monopolise the supplies; and the ultimate application of the sums raised in the manner above stated was to pay the price of those imprudent purchases. Mr. Lockhart may possibly feel inclined to question the accuracy

of this statement; but we shall establish it upon the authority of both Sir Walter Scott and Mr. James Ballantyne, which we conceive to be the best that can be produced. But, before doing so, it may be proper to introduce here an extract from the third volume of the ‘Life’ (p. 62), illustrative of that *secleratus amor terra*, and other minor but expensive propensities, for which Sir Walter Scott was so conspicuously distinguished. The whole of that financial system by which these cravings were partially satisfied must now be laid open. Mr. Lockhart alone is responsible for the necessity of the exposure. He has stated, in broad and unqualified terms, that Sir Walter Scott never drew money from the printing concern; and in one sense this may be said to be true. But he did what was precisely the same thing: for, by a document before us, dated the 17th of April, 1823, entitled, ‘Memorandum as to James Ballantyne and Co.'s Accounts,’ it appears that the ‘amount of discount paid on Sir Walter Scott's account, from 15th May, 1822, to 17th April, 1823, being eleven months, was 1146L 19s. 3d.’ — in other words, at the rate of more than 1200*l.* a-year, exclusive of exchanges on remittances and bill-stamps. Two-thirds of the entire profits of the business were thus expended in raising money solely for the accommodation of Sir Walter Scott. But the real state of the case may be brought out in a still more explicit and unchallengeable form. In the year 1822, James Ballantyne and Co. thought proper to balance their affairs, and, under some new arrangements, to enter into a new contract of co-partnership. This instrument was executed on the 1st of April that year. The *vidimus* then made up by an agent mutually employed by the parties is now before us; and it shews that the bills then current, in the name of James Ballantyne and Co., but for Sir Walter Scott's private accommodation alone, amounted to 26,896L 5s. 11d.; while, neither at that time nor subsequently, was there a single accommodation-bill current on account of the company itself. No means having been taken by Sir Walter Scott to clear off any part of this large sum, it was kept floating by successive renewals of accommodation-bills, the most expensive of all modes of raising money, not to say also the most precarious; and the consequence was, that a large and constantly augmenting addition was made to the original amount, by the expense attending these multiplied renewals. — But, further, whenever Sir Walter was in want of money for any purpose, ordinary or extraordinary, a new note was asked for and obtained. If a builder received a bill for work done at Abbotsford, it was generally made payable by a note on James Ballantyne and Co.; or if a remittance was necessary to buy Sir Walter's eldest son a step in his regiment, James Ballantyne and Co. were called upon to assist in the same form. Thus, the sum which in December, 1822, was only 26,896L 5s. 11d., had, at the time of the bankruptcy in 1826, been increased, by stamps, discounts, and bank exchange, by 8085L 3s. 1d.; and by promissory notes granted to Sir Walter Scott by James Ballantyne and Co. for the other purposes enumerated, by the sum of 17,142L 18s. 10d. It is so far from being true, therefore, as Mr. Lockhart affirms, that Sir Walter Scott never drew any thing from the business, that there is the most conclusive evidence to shew that, excepting the means necessary to carry it on, and Mr. James Ballantyne's personal and family expenses, he drew from it all its earnings, and more than all. Mr. James Ballantyne's whole

\* Mr. Lockhart states incorrectly, ‘Life,’ vol. II. p. 223, that the bond of copartnership only bound Scott ‘as one-third partner;’ he had a one-half share, as mentioned above.

† When the papers of Mr. John Ballantyne were, after his death, examined by his executors, there was found amongst them a sealed packet, superscribed, ‘Open not,

read not,’ and which was taken charge of by Sir Walter Scott. Quare — Was the ‘Memorandum’ above referred to among the contents of this packet?

share of the profits, deducting the expense of his family, was floating in the business at the command of Sir Walter Scott, besides the profit accruing to him from his one-sixth share of all the new novels, after the death of his brother John. He had cast his bread upon the waters, but it did not return to him after many days of labour and sorrow. He lost all, and was, besides, stripped of every thing he possessed, except his household furniture. Not a wreck was saved,—not even his house, which had been bought with his wife's fortune, and which, in the fulness of his confidence, he had not taken any means to secure to her and her children. All this may appear to be the very excess of unreflecting simplicity; and Mr. Ballantyne may be blamed for his apparent facility in thus lending himself to the purposes of Sir Walter Scott, and carrying his accommodations to such an extent. But, in judging of this matter, the relative positions of the parties should be duly weighed and considered. Our impression is, that he had no choice left; Sir Walter Scott, to use his own phrase, 'had laid down the law,' and refusal was not to be thought of. Besides, Mr. Ballantyne thought, that if 'the worst came to the worst,' there was Abbotsford, which would secure every one, and make up for every deficiency. Still, it is certain that he had, occasionally, misgivings on the subject; for, notwithstanding Mr. Lockhart's assertion to the contrary, he did 'make serious efforts to master these formidable balances of figures.' We have seen them, and cannot, therefore, admit Mr. Lockhart's assertion against incontrovertible evidence. He summed up Sir Walter Scott's liabilities, or rather the liabilities of James Ballantyne and Co. on his account; and he set against these Sir Walter's means of meeting them summarily, should that become necessary; concluding his estimate of available resources with, 'then add Abbotsford, so there is the head for the washing.'\*

Statement after statement, of equal force with those we have quoted, pervade this irresistible argument; but we must now confine ourselves to very brief additional extracts.

"He (Scott, says the writer,) might be lavish or extravagant in his expenditure, but he was never indifferent to, nor ignorant of, the nature and extent of his liabilities. Probably no man, situated as he was, ever kept a more wakeful and keen eye on the progress of the pecuniary transactions in the explication of which he was so deeply interested. Mr. Lockhart, however, seems entirely to forget what we have shewn to be the real state of the case,—namely, that Sir Walter Scott's fearful responsibility was not 'as a printer in the Canon-gate,' but as an extensive purchaser of land,

\* After giving a full abstract of the printing establishment accounts, it is said, "This abstract is made up from detailed accounts, which have been carefully prepared, and its general accuracy may, therefore, be relied on. It brings the whole of these matters, as it were, into a focus; shewing at one view the result of the system acted upon by Sir Walter Scott to raise money for his own purposes.—the liabilities which he contracted, incurred,—and the positive pecuniary advantages which he derived from his connexion with James Ballantyne. In fact, his large wants swallowed up every thing. The ordinary profits of the business, though considerable, were very far indeed from sufficing for his demands. He employed it as an instrument for raising and keeping afloat as long as possible the enormous sums above specified; and when the machinery would no longer work, and the day of reckoning arrived, it was found that the estate purchased with the funds thus raised had been placed beyond the reach of creditors. Mr. Ballantyne's all was swept into the vortex of bankruptcy; and, by the acts of another, his friend and partner, he became 'a broken man.' But he lived to repair his ruined fortune, and thereby to prove to the world that the business, if left to itself, would have been lucrative and prosperous; and that, under his sole management, it proved a thriving concern."

and co-obligant with Constable and Co.;—though, in the paragraph immediately preceding the one we have quoted, he informs us that, as late as May 1825, Scott was 'meditating a new purchase to the extent of 40,000/.,' to be paid for, of course, upon the credit of James Ballantyne and Co., and Constable and Co. Mr. Lockhart, therefore, may spare his 'sighing comments,' or, if he delights therein, reserve them for those who were the real victims of that mania which destroyed all within its sphere of operation."

Into the account, and monstrous amount of bills and counter bills, we cannot enter:—if figures do not err, the array is as afflicting as it is terrible; and the only suggestion that offers itself to our minds as an apology is, that Mr. Lockhart might, in his natural desire to elevate Scott, undesignedly forget what was due to others. The Ballantynes, however, have no longer a degraded memory: this pamphlet is the best inscription on their tomb.

*The Life and Times of Louis the Fourteenth.*  
By G. P. R. James, Esq., Historiographer in Ordinary to Her Majesty. Vols. III. and IV. 8vo. London, 1838. Bentley.

We rise from the perusal of the two last volumes of this work, with the conviction that it merits, by the industry displayed in collecting and digesting materials, and by the generally pleasing manner in which it is arranged and written, a place among the best historical works of the present day. Without pretending to have extended his researches to inedited sources, Mr. James has examined and used all the ordinary printed works, which in any essential manner bear upon his subject. As we have already observed, in noticing the former volumes, we by no means agree in many of his estimates of personal character, and we think that, sometimes, his views of the spirit and tendency of public measures and events are rather rash, and what our Germanists would call one-sided. His rashness in forming opinions is sometimes exhibited strongly in little matters, and we are tempted to point out one which, though a trifle as far as it concerns the book, affects the orthography of the name of one of our most eminent literary contemporaries. The name to which we allude is that of Sir William Lockhart, Cromwell's ambassador in France (who commanded the English auxiliaries at the siege of Mardyke), which Mr. James prints without the *h*, *Lockart*, justifying himself by the following note.—"I find the name thus written in two editions of the memoirs of the Duke of York, afterwards James II." This is clearly taking the exception instead of the rule. In Sir William's own time, when his name occurs most frequently in print, there was no uniformity of spelling—he does not even write his name always uniformly in his own letters, though he most generally uses the *h*, Lockhart; and as these letters are easy of access, and illustrate more or less the court of Louis, we think that they ought to have been consulted previous to the adoption of a new mode of spelling the name. We may quote an example of the danger of making off-hand general assertions. Mr. James says—"From the accession of Clovis till the present day, France has never produced any thing at all deserving the name of an epic poem." We imagine that Mr. James does not pretend to know any thing about French literature during at least five-sixths of this long period: in fact, nothing at all is known of that literature during about one half of it; but it is now perfectly understood, that the poems of Garin le Loherain, and the

like, commonly known by the title of "Chansons de Geste," a very numerous class of productions of the thirteenth century, are, many of them, as perfect epic poems as the "Iliad" of Homer. The French language itself was far more majestic and nervous in the twelfth and thirteenth centuries than it is now.

But, not to dwell upon these matters, of no great moment when compared with the whole, there is one stumbling-block on which we think Mr. James has, in some measure, fallen—that of thinking it necessary to make the subject of his history cut the best figure possible. There is too much inclination to elevate the virtues and glaze over the vices of the *grand monarch*. We can only view the character of Louis the Fourteenth as that of a magnificent and selfish tyrant. Faithless, unjust, luxurious, extortionate;—the very measures which are pointed out as most meritorious were only undertaken or encouraged to flatter or gratify his royal vanity. The unprovoked and brigand-like aggressions on all his neighbours, the savage devastations in Holland and the Palatinate, the barbarous and impolitic massacre of his Protestant subjects, the unbounded licentiousness of his court, are but a few of the stains which must ever be inseparable from his memory. It is true, as Mr. James insists more than once, that there was not much blood shed on the scaffold for treason during his time, but this is far from an acquittal of cruelty or tyranny; a public execution requires a public trial; but the most merciless despotism is that which is exercised slowly and in secret;—the annals of the bastile alone are a disgrace to the reign of Louis XIV.

These defects, perhaps in themselves not very important, are compensated by a clear and conspicuous narrative of the events of this long and memorable reign. The campaigns which raised Louis's glory, the negotiations which displayed his treachery and his cunning, the domestic intrigues, whether among his mistresses or his ministers, are all laid distinctly before our view. Satisfied with recommending the book as a work of a very superior kind in comparison with the mass of trash with which, in the name of history, the world is now every day deluged, we proceed to give a few extracts from the two last volumes.

*Raising the Wind.*—"Shortly after, the states of Languedoc were assembled, and Mazarin demanded from them a grant of one million five hundred thousand livres. The province was poor and exhausted, and the states, but especially the clergy, remonstrated vehemently, declaring that their congregations would be utterly ruined. It was immediately suggested to Mazarin that flight might do more with the province than persuasion; and, in a few days after, a packet arrived for the governor, announcing that the army of Catalonia was to take up its winter quarters in Languedoc, and giving directions respecting all the arrangements for distributing the troops through the province. The states immediately, in imagination, beheld themselves eaten up by the soldiery, and a very brief calculation shewed, that the contributions which would be enacted from them for the support of the army would amount to ten times the sum demanded by the cardinal. At the same time, it was adroitly insinuated to the principal members, that there might be means of changing the destination of the army. Sixteen hundred thousand francs were immediately voted, and the forces from Catalonia were quartered in Guienne, as had, in fact, been intended throughout."

*Last Days of Mazarin.*—"On all occasions

of ceremony, when it was necessary to receive strangers, he now made use of a great quantity of paint to hide the ravages of disease. Those ravages, however, were too apparent to be concealed from any person who had ever seen him in a better state of health. One of the foreign ministers, having been admitted to his levee while in this condition, whispered to a friend after gazing on the rouged countenance of the cardinal, 'The painting is good for a copy, but it wants the spirit of the original,' and Gourville, who met him five days before his death, carried about in a chair through the park at Vincennes, declares that it was evident that his life was at an end. From him, indeed, Mazarin made no effort to conceal the fact, telling him in plain terms that he was dying; and, at length, after having called the royal family around his bed, and having made each of them a present of some superb jewel, he took a solemn farewell of those with whom he had been so long and so strangely connected—begged them not to visit him again, as his existence would be soon over—called all his domestics and attendants round him, and sitting in his chair, full dressed, with his beard neatly trimmed, his red robes on, and his clerical cap upon his head, he asked their pardon for any evil that he might have done them, for any harsh word or violent conduct he might have used, and bade them good by for the last time. He occupied himself, as long as he could hold the pen, in signing despatches; and a few hours before his death, after feeling his own pulse, he exclaimed, judging by the strength which yet remained, 'I shall still suffer a good deal.' He died between two and three o'clock in the morning of the 9th of March, 1661. A few hours before his death, his medical attendant informed him that a comet had just appeared; and, believing that the physician wished to apply the portent, as it was then considered, to his own exit from the world, he replied, with a contemptuous smile, 'The comet does me too much honour.' But one of his own acts, performed a few hours before his decease, is, perhaps, still more characteristic of the age, and of the man. This was, to send the Chevalier de Meré to the chief president, begging him to declare, in his name, to the parliament, that he died its very humble servant. This was the last public act of Mazarin."

*The Duke D'Antin.*—"His best quality, perhaps, was, that he never spoke ill of any one; but this was counterbalanced by so many measures, by such base flattery, and pitiful subserviency, that even this good trait was looked upon rather as the effect of fear than of charity—a weakness rather than a virtue. He was famous as an epicure, as a gambler, and as a coward; the latter, indeed, to such a degree, that, we are assured, it had become shameful to insult D'Antin. Nevertheless, he had great talent for war; and could his cowardice have been done away with, it was universally admitted he would have been one of the first generals of the age. His whole attention, however, was to succeed by flattery; and that flattery extended not only to the king, but to all the king's favourites; not only to all the king's favourites, but to all their favourites, to the valets of the king, and to the valets of the king's favourites. On the occasion of a visit paid to him at Petit Bourg, by the king and Madame de Maintenon, he caused a complete account to be taken of her apartments at Versailles; the furniture, the books, the manner in which they were thrown upon the table, the very places in which they were marked; and,

on entering the house of D'Antin, she found the suite of rooms prepared for her, precisely in the same state as those she had left. Besides this, every thing had been done to afford amusement, pleasure, and comfort to every one that accompanied the court, from the very highest to the very lowest; and, during the course of the day, D'Antin contrived to visit every one in his own chamber, down to the very valets, and to do the honours of his house to all. The king was much pleased with all that he beheld, and praised every thing highly, except an alley of horse-chestnuts, which, though very beautiful in themselves, cut off the view from the king's apartments. The monarch remarked the fact to D'Antin; but, the next morning, when he looked from the window, the trees were gone. Not the slightest trace of them existed, nor of the labour by which they had been removed. No one had heard any noise, no one had perceived any confusion; but the trees were gone, the ground smooth and even, and a beautiful view stretching out before the windows of the king. Madame de Maintenon repaid him for all his civility by a rude and bitter jest as she quitted his dwelling; but the king bestowed upon him, a fortnight after, the government of the Orléanais."

*The Count de Grammont.*—"The king was at play, as was too frequently the case, when a dispute arose in regard to one of the turns of the game. The king was eager, but his opponent would not yield, and the courtiers around maintained a respectful silence. At that moment, the Count de Grammont was seen entering the apartment; and the king immediately exclaimed, 'Come hither, Grammont, and decide this dispute between us.' 'Your majesty is in the wrong,' replied the count immediately, without waiting to hear more. 'How can you say I am in the wrong,' cried the king, 'before you hear the point in dispute?' 'Why, sire,' replied the count, 'if the matter had been even doubtful, all these gentlemen who stand round silent would have decided in your favour long ago.'"

*The Duke of Montausier.*—"Amongst those who stand out most prominently from the picture of the reign of Louis XIV. by their dissimilarity from the rest of his courtiers, was the famous Duke of Montausier, who had been appointed by the king, governor to the dauphin. We find him stigmatised by some of those who probably suffered from meddling with him in an impudent manner, 'as a bunch of nettles which stung on whichever side they were taken'; but Montausier was, in reality, a man of plain, simple, and rigid principles, somewhat phlegmatic in character, and, perhaps, a little cynical in disposition, but still noble, generous, and elevated in all his feelings, though frequently irritated so as to say severe things by the impertinence and frivolity of the court in which he lived. On one occasion, in a dispute between him and his young pupil, the prince imagined that his governor had struck him; and exclaimed, with fury and indignation, 'How, sir! do you strike me? Bring me my pistols!' 'Bring his highness's pistols,' said the duke, coolly; and, causing them immediately to be given to the dauphin, he added, 'Now, sir, see what you are going to do with them.' The dauphin was struck and touched; and when, after having finished his education, Montausier gave up his post, he did it with these words, 'Sir, if you are an honest man, you will love me; if you are not, you will hate me; and I shall console myself.' \* \* \*

"On the occasion of the taking of Philipburg by the dauphin, Montausier wrote to

him a very different letter from those which the prince received from the other persons at the court. 'I do not compliment you, monsieur,' he said, 'upon the taking of Philipburg; you had an army, an excellent park of artillery, and Vauban. I rejoice with you, that you have shewn yourself liberal, generous, and humane, putting forward the services of others, and forgetting your own.' It is upon this that I have to compliment you."

The foregoing extracts will sufficiently shew the anecdotal character of many parts of Mr. James's history. We recommend it cordially to our readers, for there are few periods in history more interesting for the variety of movement and action, and the extraordinary prominence of individual character, by which its many vicissitudes were marked. Among the darker and more singular questions which Mr. James has investigated at some length, none of the least are the history of the prisoners, and of the celebrated man with the iron mask; which latter still remains a matter of doubt and mystery.

*The Deserted Bride, and other Poems.* By G. P. Morris. 8vo. pp. 80. New York, 1838. Adlard and Saunders.

SUCH is the title of a volume of poems which have been published in America, and which, we must add, are very superior to the generality of similar works that have lately appeared in our own country. There is no attempt at greatness in this unassuming volume; no high-sounding words to cloak a host of unintelligible ideas; but a simple truthfulness, and a deep natural feeling, which have for us, in these days, a very uncommon charm. Several of these little poems, we are glad to hear, have already become very popular (and deservedly so) among our Transatlantic neighbours; this speaks loudly for their good taste. Nor will we waste further space in bespeaking favour for what stands in no need of our recommendation; but present our readers with a lyric, such as any author might feel proud to have written.

"When other Friends are round Thee.

When other friends are round thee,  
And other hearts are thine;  
When other bays have crown'd thee,  
More fresh and green than mine,  
Then think how sad and lonely  
This doting heart will be,  
Which, while it throbs, throbs only,  
Beloved one, for thee!

Yet do not think I doubt thee,  
I know thy truth remains;  
I would not live without thee,  
For all the world contains.  
Thou art the star that guides me  
Along life's troubled sea;  
And whatever fate betides me,  
This heart still turns to thee."

Nor can we allow the volume to slip away without giving another specimen of the author's abilities; the more so, as it is a jump from "grave to gay."

"The Miniature.

William was holding in his hand  
The likeness of his wife—  
Fresh, as if touched by fairy wand,  
With beauty, grace, and life.  
He almost thought it spoke:  
He gazed upon the treasure still,  
Absorbed, delighted, and amazed,  
To view the artist's skill.

"This picture is yourself, dear Jane,  
'Tis drawn to nature true:  
I've kissed it o'er and o'er again,  
It is so much like you,  
And has I kiss you back, my dear?"  
"Why—no—my love," said he.  
"Then, William, it is very clear,  
'Tis not at all like me!"

There are a few very spirited stanzas, entitled "Fragment of an Indian Poem," but want of space prevents us from quoting them.

The same apology must extend to the verses which give the title to the volume; many of which we would willingly transfer to our pages. We, however, conclude by cordially recommending the work to our readers, as possessing many singular beauties and much original merit.

*Recollections of a Tour in the North of Europe, in 1836-37.* By the Marquess of Londonderry. 2 vols. 8vo. London, 1838. Bentley. We always find our task light when we are called upon to pass judgment on the works of our intelligent nobility, and we think our stores of this class of literature would be materially benefited, were more of our travelled aristocracy to follow the example of Lord Londonderry, and give publicity to their impressions and recollections of the different countries they visit in their autumnal tours. The noble author is a pleasant traveller and an acute observer, so we shall proceed at once to extract from his recollections.

Of clubs, which are not plentiful in St. Petersburg as in London, we are told:—

"The only two clubs I heard of were the English club in the Moska, and a club of citizens near the Hotel Labanof. The former deserves some description. It is composed of three or four hundred members, originally established by the English members of the Russian company. It was first opened in 1770, but, from the falling off of the British residents at St. Petersburg, by degrees Russian gentlemen, citizens, and officers were introduced; and there are now more of the latter than the former. It is amusing to dine with this society, and to observe, after dinner, each nation resorting to its peculiar habits. The Russians, who invariably rise when eating is finished, leave the dining-room, proceed to billiards, cards, chess, reading the newspapers, and their cigars. The English call for their wine and punch, give toasts and make speeches, pretty much as at any public dinner in England. There is a very gentlemanlike set of British residents now at St. Petersburg, and I passed a most agreeable and interesting day at this club. They have all the Russian and some German and French journals; but the entrance of newspapers into Russia is under strict surveillance; and although the noblesse, merchants, and persons of wealth and rank, know what is going forward in the rest of the world, and receive most of the publications after going through the censors' hands, the generality of the inhabitants and citizens are greatly ignorant of passing events beyond those in their own capital. I did not attend the Bourgeois club, and can give no account of it."

The Empress seems, from the following, to be a kind and affable woman:—

"At five o'clock in the evening of our arrival, carriages were sent for us, to proceed to our presentation to the empress, and to dinner. We found a large circle present in a very spacious room of three compartments, separated by columns. In the centre division were laid the tables for dinner; in the end compartment the company were assembled. The Nesselrodes had preceded us, and many of our St. Petersburg acquaintance were already arrived. It was uncertain in what manner the empress would receive us, whether we were to be presented by our own ambassador, or by the high officers and *dames d'honneur* of the court. At length we found that the empress had commanded her grand maître, Prince Volkouski, and Madame Nesselrode, wife of the minister for foreign affairs, to introduce us,

and we were honoured with a private audience of her imperial majesty. She entered the apartment, into which we were introduced, with the Grand Duke Heritier, Cesarowitch. She came immediately up to me, and in the most gracious manner accosted me as an old acquaintance, remembering me (she was pleased to say) perfectly, in 1813, in Silesia. The indescribable majesty of deportment and fascinating grace that mark this illustrious personage are very peculiar. Celebrated as are all the females connected with the lamented and beautiful Queen of Prussia, there is none of them more bewitching in manners than the Empress of Russia; nor is there existing, according to all reports, so excellent and perfect a being. After a kind and gracious conversation with me, she turned to my companions, and, while talking to them, the Cesarowitch approached me. He is eighteen, remarkably tall and handsome, has a benign countenance and a princely air, and is undoubtedly one of the handsomest young men that can be seen. The Princess Olga, the younger of two sisters, was in the background; she appeared about fourteen or fifteen, fair and delicate, but tall, with very brilliant and large sparkling eyes."

The higher classes appear to live in a more simple manner than we do in this country.

"In Russia, however, I observed generally that—whereas a great dinner in other places, either abroad or at home, consists of eighteen or twenty-four different *entrées* and *entrements* in each course—the greatest dinners in St. Petersburg have only six or eight *entrées*, the same being so multiplied that the dinner goes on rapidly, and is universally well served. Every luxury and production of the world can be procured in this capital, and nothing can exceed the splendour, comforts, and good taste of the court and the aristocracy. I must observe, however, in fairness, when speaking of the table, that vegetables and fruits alone are an exception; these are very inferior to those grown in France and England, and the meat in winter goes through certain processes, when in a frozen state (before it is cooked), that make it more tasteless than in England. Beef in general is good, but I never ate good mutton in Russia, except at Count Nesselrode's table, and then it was produced as a species of feast."

Of the climate at particular seasons we have the following remarks:—

"It is difficult to describe the effects of the weather and climate of St. Petersburg, at this period of the year, upon those who are not accustomed to them. Fortified by a long residence, or by birth, on the spot, the constitution may be rendered inaccessible to attacks of this description; but I feel persuaded that no Englishman can go to Russia without passing through the ordeal of more or less of that sort of severe illness with which my family were now visited. To young persons, especially females, I believe nothing can be more trying than the temperature at this season. There is a dry, bleak wind, blowing from the boundless plains and tracts of the interior, which is met at Petersburg by the raw, damp breeze of the Gulf of Finland, and the heavy dews of the Neva; and the unhealthy ingredients of these elements, thus mixing in the wide streets of St. Petersburg, form an atmosphere more disagreeable and unbearable than can be experienced elsewhere."

The noble marquess was always treated with the utmost kindness by all the imperial family, and many of his sketches overflow with gratitude for the attentions he received during his

tour; but much of this cannot be extracted, and we are, therefore, reluctantly compelled to close our notice of this pleasant work.

We should, however, add, that there is a second part, composed of historical, political, and statistical details of most of the northern capitals, relieved by accounts of voyages of discovery, the state of trade, &c. The volumes are also ornamented with some portraits and plans; they are well executed, and add materially to the value of the work, which we strongly recommend as a delightful travelling companion.

*The Beauty of Holiness, and other Poems.*  
By G. B. Scott, author of "Leisure Hours," &c. 12mo. pp. 157. London, 1838. Darton and Harvey.

We speak it with sorrow, but there is more trash published under the denomination of *religious* poetry than any other; and the very nature of the subject in some measure disarms criticism. Further, when we see the beautiful language of Scripture mutilated by those modern rhymesters who put it into the form of verse, we conclude that, at heart, they have no religion, no love, no veneration for the sublime passages which are scattered, like the stars of night, over the holy volume. Much as we reverence the sacred writing, it would militate greatly against the pleasure and the benefit which we should receive from reading the beautiful parable of the "Prodigal Son," if a remembrance of the senseless trumpery entitled, "I will arise and go to my Father," which is found in this volume, were to cross the mind. Nay, were we not good Christians, we never could bear to read the above-named parable again, after having perused the author's trash. If he really has that love for what is holy which he professes, we would beg of him never to render unsightly that which hath so long haunted us as "beauty and a mystery," not to cover these venerable and sacred images with his horrid white-wash, nor lay his sacrilegious hands upon the holy passages of Scripture. Very few, even amongst our greatest poets, have succeeded in rendering paraphrases from the Bible readable; how then, can a person who has no more poetry in him than a fire-poker hope to succeed? We give a few morsels, to shew that our censure has been justly called for. Here is a precious bit—

"For he, who, once oppressed with gloom,  
Trod the dark way with murmuring;  
Shall now arise, as from death's tomb,  
And run to Calv'ry, wondering!"

Again:

"Teach of the Saviour, in whose cause,  
Archangels clap their joyful wings;  
Teach of the Saviour's love, which draws  
Thy soul from death in beauteous strings."

Surely, he must have seen some bantam clap its joyful wings to suggest this thought. And here is a modest finish—

"Hush, then, my lyre; thy notes are meet  
The theme of heavenly bliss to swell,—  
Yet who shall all her beauties tell?"

#### ORIGINAL CORRESPONDENCE.

To the Editor of the *Literary Gazette*.

New York, August 4, 1838.

SINCE my last (see *Literary Gazette*, July 14), a report has been made to congress on the discovery of the longitude by Dr. Sherwood. The report is favourable, and 5000 copies were ordered to be printed for distribution. The doctor contemplates visiting England in the course of the fall, for the purpose of claiming the reward offered by the Board of Admiralty, and to secure a patent for the united kingdoms.

The report has created quite a sensation among our scientific men, who appear divided upon its practicability. Professors Dwight and Silliman approve the discovery, and their approval gives a sanction to it at once with a large class. Professor Rogers disapproves, and a number give way to his opinion. For my own part, I feel perfectly convinced that the doctor has stated no more than is actually true, and in which he will be borne out by the most perfect demonstration.

Mr. Bennett's improved fuel-saving steam-engine has been taken from the original boat, and is shortly to be placed in another. There can be no doubt of its eventual success, though Mr. B. is poor, and this may prevent his perfecting his discovery for some time to come.

It has been proposed to introduce upon our waters the high-pressure boats of the Mississippi; and I think another year will see them used generally for the purpose of towing vessels in and out New York Harbour. They are much more powerful than the low-pressure engines, and give very little motion to the boat. They are generally horizontal; and the boats do eighteen miles with the current, and twelve against it, per hour. Our North River and Long Island boats are all lower pressure. Their speed is generally from sixteen to eighteen and nineteen miles per hour.

We are making rapid advances in the cultivation of the mulberry and the growth of silk. Several large cocooneries have lately been established in the state of Connecticut, and bid fair soon to yield a handsome profit. Our country is particularly calculated for the growth of mulberry, and the next ten or twenty years will find the Union exporting, instead of importing, silk. I have now upon me a very beautiful vest, made of the finest American silk, manufactured in Connecticut. It is a pure white, and pronounced equal to any foreign ever imported to this market. To be sure, it cost more than French or English; but we are improving so rapidly, that we can soon furnish the article as cheap as we can purchase it abroad.

Some exertions are making toward the culture of the sugar-beet in Ohio, and I understand the project is likely to succeed well, though I can at present give no particulars, except that large tracts of lands have been purchased, and the seed of the sugar-beet imported from France.

I was yesterday invited by the American Institute to view a new screw-cutting machine, which will, I think, be of great utility. It is simple, and costs but little. It is constructed after the model of the common chaser. Four small wheels, with chasers on the peripheries, are placed so that the edges come near a centre beneath a common driver. The screw descends between the chasers while they are revolving, and is neatly threaded in six seconds. This machine will enable us to make screws as cheap, if not cheaper than we can import them. The inventor is a raw Yankee. That is, what we call a Yankee in this country. He is from Connecticut, and has, I understand, several other very valuable machines. His screw-cutter was patented on the 9th of July last. A machine with two cutters can be driven by a boy at a wheel, and costs only \$28. Our cheapest, heretofore, have cost from \$100 to \$150, and required steam or horse power.

The electro-magnetic engine has not been improved since my last, and I fear the ingenious inventor has more difficulty to contend against than he at first contemplated. It has, however, excited great interest, and Mr.

Davenport now has rivals who are endeavouring to excel him in completing a perfect engine. They have power to drive a small wagon, weighing about thirty pounds, round a circular railroad. Beyond this they have done nothing.

Some attempts have been made at raising vineyards at the West, but I fear our people do not yet sufficiently understand the culture of the grape to make it profitable. The climate of Arkansas is admirably adapted for the vine; but the projectors have gone further north, and where their efforts will probably prove useless.

A steam navigation company has been started in New Orleans, to run between that city and Liverpool; and another to run between New Orleans and this city. The first of the latter line was to leave New Orleans on the 19th ult. We have not heard of her; she either did not sail, or has been lost. The passage is considered more dangerous than that hence to England, because the vessels along our coast are kept in the trough of the sea the whole distance.

The finest steam packet we have upon our sea-coast is the Neptune. She runs between this and Charleston. There is some talk of her going to England. She will amaze you if she does; she is a beautiful model, but no more calculated for a rough sea than a *bateau*. It will astonish you that men would risk their lives in such a cockleshell.

S. J. B.

#### ARTS AND SCIENCES. THE BRITISH ASSOCIATION.

EIGHTH MEETING: NEWCASTLE.

[Third notice.]

In continuing our report of this meeting, we may remark, that, where we meet with subjects which have been largely discussed in voluminous publications and passed under our review, and to which little or nothing new has been added, except in the way of argument in support of particular opinions;—or subjects, however important, continued from year to year at every meeting of the Association, where we only learn something of the carrying out of an acknowledged principle, or the progress of a chain, the preceding links of which are familiar to us;—or subjects which are brought forward chiefly to advertise articles in trade, or recommend parties to public notice;—or subjects of so abstruse a nature that no popular medium can render them intelligible or useful;—with all such cases, we repeat, it is in our judgment best to deal sparingly, and, not disfiguring what cannot be generally instructive or accurate enough for the few philosophical readers, leave for the Annual Volume of the 'Transactions' matters which, though very *indifferently misrepresented*, would entirely occupy our journal for months to come.

With this preface we proceed to

WEDNESDAY.

SECTION A.—*Mathematics and Physics.*

Sir J. Herschel, President.

The chairman again complimented the lady audience, and expressed a hope that, while endeavouring to gratify their tastes, they would not forget that science was the principal object of their meeting.

Professor Whewell read a report of the continued observations 'On the Tides at Bristol,' for which the Association made a grant at Liverpool, and which were carried on under his direction from the preceding year by Mr. Bunt. They had endeavoured to obtain the law of the mean level of the tide by a simple process,

which appeared to him to accomplish as perfect a result in one year as Mr. Lubbock's tables for nineteen years. He did not mean to disparage the value of those important calculations, but merely to observe, that he thought as certain and accurate data were afforded within the shorter period by the plan they had adopted. It consisted of this. They marked the highest points reached by the tide at spring, mean, and neap, and then reduced them to curves by drawing lines through them. The lines representing the height of the tides, and the intersecting curves giving the general laws which, being reduced, would not only enable them to determine the mean height, but also supply data to solve many of the difficulties attached to the subject.

Mr. Whewell observed, that he expected to attain still further laws, from the examination of the residue left by Mr. Blunt's observations. He had given the results of these discussions in his ninth series of *Tide Researches*, in the 'Philosophical Transactions.' In that communication, answers would be found to the thirteen following questions:—1. To which transit of the moon ought we to refer a tide? 2. How does a change of the epoch affect the semimensual inequalities? 3. How does a change of the epoch affect the (lunar) parallax correction of the time? 4. How does a change of the epoch affect the (lunar) declination correction of the time? 5. How does a change of the epoch affect the parallax correction of the heights? 6. How does a change of the epoch affect the declination correction of the heights? 7. Does the parallax correction of height vary as the parallax? 8. Does the parallax correction of time vary as the parallax? 9. Does the declination correction of heights vary as the square of the declination? 10. Does the declination correction of times vary as the square of the declination? 11. Can the laws of the corrections be deduced from a single year? 12. Are there any regular differences between the corrections of successive years? 13. Do the corrections at different places agree in laws and in amount?

Sir J. Herschel expressed his gratification at the results which were constantly developing themselves from the employment of curves for registering the phenomena, and, as it were, depicting them to the eye. These curves, among many other uses, had the advantage, as Mr. Whewell had just shewn, of enabling us to compare most readily and simply theory with actual observation, thus detecting previously unsuspected discrepancies, and enabling us to find where error lurked in the theory, and to correct it. In fact, such was their utility, that most probably there would soon be no comparison instituted with isolated observations.

Some conversation followed, in which a doubt was expressed whether this system could satisfactorily account for the tidal phenomena in other localities, so as to become a general law.

The next paper read was a report from Mr. Russell,\* 'On certain Experiments on the Laws of the Motion of Waves,' which had been conducted by Sir John Robinson and himself, at the request of the Association. The object of their investigation had been, first of all, to determine by observation the formal laws of the motion of waves; then to examine their phy-

\* This gentleman's preceding paper in the Section of Mechanics treated of the resistance of fluids to solid bodies passing through: the present chiefly treats of the "behaviour of the particles of water composing a wave in the solid of the resistance." Like all his investigations, it is of deep practical interest, and its philosophical contributions to the science of this meeting.—Ed. L. G.

sical mechanism, the minute phenomena of the individual particles of the fluids, in such a manner as to enable them to obtain distinct physical conceptions of the manner in which the motion of waves was propagated. This was important, because, if they could thoroughly understand the mechanism by which the waves were constituted and propagated, they could then express the results either in geometrical or analytical language, and understand the theory. In the course of investigation it was found, that the translation wave presented certain remarkable analogies to the tidal wave; so that a second department of investigation arose, namely, the examination of the tidal wave as compared with this particular wave. The phenomena of the wave of translation were intimately connected with the phenomena which took place in the fluid when it was acted on by a solid moving body; and, consequently, the relation of the phenomena of this law of waves to the resistance of fluids formed another part of the examination. The report of the preceding year contained a great portion of what had been done this year; but the observations were such that they would probably not be completed in several years. What they had done this year had been to complete, as far as they possibly could, the second of these departments of investigation—that which related to the physical investigation of waves. They had previously determined the formal form of the wave; that was to say, they had considered it as a particular kind of wave, having a given velocity and a given form; and they had determined that the velocity of the wave was totally independent of the manner in which it was generated, and depended only upon one circumstance, namely, the depth of the wave. But this was a merely formal result, and their present object was to investigate the physical operation of the wave. In the formal investigation, they experienced considerable difficulty in ascertaining the form. The nature of a wave was such, that it was exceedingly difficult to detect its form, because it required an instantaneous observation, made with great precision, by a number of observers in a small space, and with a minuteness which exceeded any means of ordinary calculation. The method proposed by Professor Stevely had been satisfactorily applied to the land wave, which they found little more in length than six times the depth of the fluid. But they also found that this did not hold in all cases; for when the wave was very high the quantity was much greater; but when it was low it was exactly the same. So that just when the wave was about to disappear, it was found that its length was six times the depth of the fluid. Now they could not define a form unless by fitting it into some form already known; and from all that he could learn, the only class of curve to which there was any likelihood of fitting this wave was the trichoidal, of which the cycloid was the termination. The form, as observed by Mr. Russell, was almost precisely cycloidal; it was the cycloid apparently, but of double the length which the circumstance of its being the cycloid would have given; because it was manifest that, taking the limits, and supposing the wave to be a cycloidal wave, it would only be the circumference of a circle of which this was the diameter, or little more than three times. Now the cycloid was six times the quantity. Thus another set of curves became necessary, and that set was the cycloidal set formed by a circle equal to double the depth of the fluid. This question settled, they found that the curve which the wave would fit was not a cycloid, but an analogous curve, which he (Mr. Russell) should be disposed to

call the semicircular cycloid. For the purpose of ascertaining the physical constitution of the wave, and how it was propagated, the reservoir they had previously constructed was formed in a certain part of plate glass, the object being to float particles in water, and to observe the phenomena which took place among these particles while the wave was passing over them. He had previously examined many observations which had been made in Germany. Gesner had described the oscillating wave, and the ocean wave, in all their phenomena. He (Mr. Russell) called his the primary wave, or great wave of the translation of the fluid. The glass side of the vessel was carefully divided, so as to enable the eye to determine the results; and the following phenomena took place among the particles so invariably, that on the slightest observation the results could be calculated. Suppose that the particles were in a given place at right angles to the direction of the motion of the wave, when first the wave came there, the particles would begin to move in the direction of the motion with accelerating velocity, and be at their maximum when the top of the wave was immediately over them; then with retarding velocity; and at the instant when the wave left the place, the particles would be at rest in precisely the same position to one another as they occupied previously to the translation. They were put forward without the slightest displacement. The next question was the path of translation, which was a curious and simple matter. While the particles were in their progress forward they were also raised. They were transferred forward horizontally to a distance equal to twice the height of the wave; and the curves which the uppermost particles described were as exactly as possible the circles described upon the length of the wave. In the examination of this subject, it would be found that the vertical translation of the particles was in exact proportion to their distance from the bottom; and it would likewise be found that this was just what was necessary. Mr. Russell went on to examine what was the curve of the wave that resulted from these motions, and whether it was the curve which he had observed; and then touched upon the reflection of the wave. The next part of the subject to which he directed attention, was the relation which the translation wave bore to the phenomena of the resistance of fluids. He had previously ascertained that the displacement of a fluid by a vessel took place, not in the body of the current, but solely by the generation of waves. Now the manner in which they were generated appeared to throw light upon the subject of the resistance of fluids; because they wished to have exactly the same transference for particles of matter which was required for transference of waves. They wished to remove the fluid from a state of rest, and admit the vessel to pass through. Now they found, that whenever the displacement took place in the wave, they had the phenomena of least resistance. So that, in forming a floating vessel with this wave-line disposed on alternate sides, so as to give such little motion to the particles as to displace nothing more than was necessary, and not for a greater distance than was necessary to allow the vessel to pass, they obtained the solid of least resistance. Since that time, a variety of experiments on large vessels had been performed; a number of steam-vessels were now constructed on this line; and it was a remarkable fact, that the fastest vessel on the Thames was one to which this form has been given. Several other vessels had since been

built on a large scale on this construction, and he was happy to find that a great number of ship-builders had adopted, and were building vessels with great success, on this line. It was scarcely credible that a vessel should move at the rate of fifteen miles an hour, and not raise a spray,—not raise any thing like that high mass of water which was always found at the bows of vessels going at speed, but keep the water perfectly smooth, and leave it smooth, and as much at rest in the direction of the displacement as it was before the floating solid passed. This phenomenon had invariably accompanied all the vessels formed on this line. Now this appeared to him (Mr. Russell) to shew the correctness of a remark made by a French writer, who said he could prove, from the mathematical theory of fluids, that the resistance to a solid body, if properly formed, was nothing. He challenged the mathematicians of the day to disprove his assertion, which was never done; though, what the proper form could be, he confessed that he himself did not know. Now he (Mr. R.) thought he had quite manifested the possibility of a vessel moving through the water with little or no resistance. On making allowance for adhesion to the sides of the vessel (which they knew might be done correctly, from experiments made by others), they found that the resistance of the vessel was not one-twentieth part of the mere adhesion of the water to the sides of the vessel; so that the resistance from displacement of transference was nearly nothing. A large vessel having been made in this form, the following experiment was performed. Two oranges were placed in the direction in which the vessel moved. The person steering, after many attempts, at last succeeded in insinuating the prow of the vessel between the oranges. They rolled along the side of the vessel, remained in contact therewith, returned at the wake, and when the vessel passed, they remained at rest; they had been transferred horizontally in the manner of a wave, and remained at rest in precisely the same position as they were when the transference commenced. This appeared to him to be the strongest test, and if this vessel was not a solid of least resistance, it was closely allied to it. [The chairman—I should say it was a vessel of no resistance.] There was another thing which he might mention, namely, that as steam-vessels built on this line did not produce the waves which were at present so injurious to the banks of rivers, &c., perhaps its introduction would be attended with great advantages in this respect. He felt certain, indeed, that it was a form to which ship-builders must ere long be driven. It was the theoretical form of least resistance which he (Mr. R.) gave at Dublin three years ago; but it was not until he discovered the law of transference of the wave that he found that he had hit upon the very form for this vessel. Ship-builders had been in the habit of saying,—whatever you do, let us have no hollow lines. The maxim now was, at least of those ship-builders who had carefully examined the subject, let us have the hollow lines where we want them, and then we shall have plenty of scope for making fuller lines where they will not injure the progress of the vessel. He (Mr. R.) should now have entered upon the connexion of the subject with the theory of tides, because he thought he had identified the theory of this wave with that of the tidal wave; and whatever influence the celestial mechanism might have upon the tides, they must yet depend upon terrestrial mechanism

for bringing it to their doors. He thought they could get a great deal more knowledge about the theory of waves by tidal observations, because there they had a large, long, slow wave, which could be examined with great minuteness. Time, however, would not permit him to enter upon the subject; and he begged to thank the Section for the patience with which they had so far heard him.

Congratulatory and interrogatory remarks followed the reading of the foregoing report.

Sir W. Hamilton spoke of the interest excited by the valuable researches on waves, and believed that thereby considerable progress had been made towards the elucidation of their physical process. To Mr. Whewell, "the behaviour of the particles" during the progress of a wave, as described by Mr. Russell, had displayed an insight into the solution of a very important problem in general hydrodynamics, by which would be obtained a knowledge of the manner in which motion was propagated through fluids. He suggested the term hemicycloid instead of the "semicircular cycloid" of Mr. Russell, because semi-cycloid, a term in frequent use, had already another acceptance.

Professor Chevalier's inquiries as to the necessity of varying the several curves of the vessels, according to the velocities at which they were to be propelled, had been anticipated and answered in the report read in Section G.

Sir J. Herschel wished to know whether the particles described semicirculars only, or whether they did not also complete the under half of their curves so as to return to their position occupied previous to their motion.

Mr. Russell explained, that a positive wave caused the molecules to perform the semi-circles, passing forward through their longer axes and there remaining; a negative wave produced a similar backward movement, but a compound wave exerted a double influence, and the molecules described the upper and under portion of their own curves, returning to the place whence they set out.

Sir D. Brewster laid before the Section a series of preparations of the eye by Mr. Clay Wallace, of New York; explained their general nature and importance; and concluded with a hope that anatomists in this country would pursue the investigation. The preparations were subsequently exhibited in the model-room.

The concluding papers read (Wednesday) in this Section were of that character described in our prefatory remarks as wisely to be treated sparingly, and our reasons were there given.

1st. 'On a new kind of Polarity in Homogeneous Light,' by Sir D. Brewster. Since his last communication to the Association, giving an account of this new property of light, which he then could not explain, Sir D. Brewster had varied his experiments; and he had now no hesitation in asserting it to be a new species of polarity in the simple elements of light, whether polarised or unpolarised. No phenomena of colour were visible in the original experiment, and the fringes were exceedingly black. In order to observe the effect when the retarded pencil passed through the edges of several plates, differing very little in thickness, so that different parts of it suffered different degrees of retardation, Sir D. Brewster, after encountering great difficulties, tried laminated crystals, and, in an accidental cleavage of sulphate of lime, obtained the desired combination of edges. This plate, observed through a perfect spectrum, exhibited a splendid series of bands and lines crossing the whole spectrum, shifting their place and changing their cha-

racter by the slightest inclinations of the plate. But what was most extraordinary, the spectrum exhibited the same phenomena as when acted upon by absorbing media, and thus, dark lines and the effects of local absorptions were produced by the interference of an un retarded pencil with other pencils, proceeding in the same path with different degrees of retardation. In another part of the experiment, a rotary motion in their own plane being given to the plates, the bands, lines, and the phenomena of absorption, gradually decrease as the angle between the edges of the plates and the lines of the spectrum increases. The bands disappear when this angle is 90°, and continue invisible during the next 90° of rotation. At 270° of azimuth they begin to reappear, and reach their maximum effect at 360°, when they will have returned to their original position. The conclusion drawn was, that the different sides of the rays of homogeneous light, when separated by prismatic refraction, or by the diffraction of grooved surfaces, possess polarity; and the homogeneous light thus treated displays the same properties as if it had originally formed part of a spectrum.

In reply to a question from Prof. Whewell, as to whether the phenomena depended in any way on the thickness of the retarding plate? Sir D. Brewster said, that the interval of the fringes appeared to increase as the thickness of the plate was diminished; and, in answer to Prof. Lloyd, had no doubt that the phenomena would be similar, in the case of a spectrum cast upon a screen, as in that of a spectrum formed upon the focus of a telescope.

Sir J. Herschel, after commenting upon the novel, interesting, and astonishing results of experiments on light, and upon the skilfully directed researches of Sir D. Brewster, which were constantly producing something of the deepest interest, observed, that these experiments presented what appeared to him inexplicable on any supposition, excepting the startling one of absorption by transparent media; and he saw very plainly that this opened an entirely new field of optical discovery.

2d. 'On the Propagation of Light in Vacuo,' by Sir W. R. Hamilton, the object being to advance the state of our knowledge respecting the law which regulates the attractions or repulsions of the particles of the ether on each other.

3d. 'On the Meaning of the Arithmetical Symbols for Zero and Unity when used in General Symbolical Algebra.'

A note by Sir J. Herschel, 'On the Vitreous Humour of the Shark's Eye,' to shew that it was not composed of a gelatinous substance, but was a fluid contained in a cellular structure, was also read.

#### SECTION B.—Chemistry.—Prof. Thomson in the chair.

The first two papers were by Prof. Graham and Prof. Andrews. In the former, an analysis of sugar suggested to suggest that it was a salt; and in the latter was explained the production of a pure hydrogen gas by the action of sulphur acid on zinc.

Mr. Mallet and Professor E. Davy's 'Report on the Action of Sea and River Water upon Iron,' was next read.

The commencement of the Report described the many advantages that would result from the discovery of a perfect protector of iron from corrosion. Water, it is well known, very much accelerates its decomposition; and iron, exposed to the action of sea-water, becomes converted into a carbonaceous substance called plumbago. Various experiments were tried by

Messrs. Mallet and Davy. A coating of zinc itself, being rapidly acted upon, at first preserved the iron, but, after a time, it was entirely destroyed, and corrosion commenced in the iron. Exclusion of air was found to retard, if not entirely to prevent, corrosion: a covering of tar effected this for a considerable period, and experiments with boiling sea-water had been made: it was, however, impracticable completely to deprive the water of air by boiling. Attention was at first chiefly directed to testing Mr. Hartley's view of the preservative power of brass; and the result was in all cases that brass, prepared in different experiments with different proportions of zinc, invariably assisted corrosion; in fact, nothing could possibly be conceived more destructive. Professor Davy lost no time in communicating this result to Mr. Hartley, as, since the Liverpool Meeting, at which he exhibited some iron slices that had been in connexion with brass, and uncorroded during twenty-five years, that metal had been much used as a protector in the construction of chain cables—a more dangerous position for its use could not be. Mr. Mallet considered the cause of the iron being in so good a state after so long a submersion, to be the deposition of mud to the exclusion of atmospheric air. In prosecuting the researches, sixty or seventy specimens of iron had been procured from the different works of England and Wales, and had been placed, by means of ingeniously formed boxes, in which they were deposited, several feet under water in Dublin and Kingston harbours; and a promising effect had been observed. The harder iron was much more slowly acted upon than the softer; in any two together the harder was also negative to the softer, and remained untouched by corrosion, while the softer had been converted into plumbago; yet still in that state it retained its electro-chemical protective power. In hydrochloric acid the hard, in conjunction with the soft, retained its brightness when the latter was dissolved. Wrought iron was observed also to be negative to other iron; but as yet the researches are imperfect, and, to obtain a mode of electro-chemical protection, wider and more important experiments are required.

Mr. Addams exhibited two instruments (extensive and ingenious improvements upon Thilorier's apparatus) for the purpose of liquefying and solidifying carbonic acid gas. They were both very ingeniously constructed, one of brass and the other of iron, with a power of resisting a pressure on their inward surface of 300 atmospheres, or two tons to the square inch, though the actual pressure of the gas, when becoming solid, amounted to no more than 90 atmospheres, or about 1400 lbs. on the square inch. Mr. Addams then performed some interesting experiments, which were new to the great majority of the Newcastle audience; and were so interesting to them, that their popular repetition at the promenade in the evening, at the Green Market, and making ice for the company, was certainly one of the best attended and most satisfactory doings of the day.

#### SECTION C.—Geology and Geography.

Before proceeding with the geological papers, Mr. Lyell requested Captain Sir George Back to take the chair during the reading of a paper upon a subject of much interest; viz. an account of the latest Antarctic discoveries.

Sir George Back said, that most of the geographical papers which had been read, referred to voyages in the northern regions, and though all had not yet been accomplished that might be wished, still the admiration and attention of

other nations was excited to similar enterprises. With regret, however, he must say, that the same remark will not apply to the South Pole, where an immense space still remains unexplored, and to which he thus alluded, in order to introduce the following notice.

“On the recent Expeditions to the Antarctic Seas,” by Captain Washington, R.N. A south circum-polar chart illustrated this account, shewing, on a large scale, the tracts of all former navigators, from Dirk Gherritz, in 1599, to that of M. D’Urville, in 1838, including those of Tasman, in 1642; Cook, in 1773; Bellingshausen, in 1821; Weddell, in 1822; Biscoe, in 1831; and exhibiting a vast basin, nearly equal, in extent, to the Atlantic Ocean, unexplored by any ship, British or foreign. In those regions, the writer remarked that the ice was far from stationary, for Bellingshausen sailed through a large space within the parallel of 60°, where Biscoe had found ice that he could not penetrate, and where D’Urville had lately found barriers of field ice; Weddell, in 1822, had advanced to the latitude of 74°, or within sixteen degrees of the pole, without difficulty; and, further, it was evident, from the accounts of all former navigators, that there was no physical impediment to reaching a high south latitude, or, at least, of ascertaining those spots which theory pointed out as the position where, with every probability, the southern magnetic poles will be found. The expedition which has just left this country for the South Seas, was likewise mentioned. This was fitted out by several merchants, but principally under the direction of that spirited individual, Mr. Enderby. Their orders were, to proceed in search of southern land, and to endeavour to reach as high a south latitude as possible. The writer concluded with an earnest appeal to the British Association, that the glorious work of discovery begun by our distinguished countryman Cook, might not be left incomplete; that all Europe looked to this country to solve the problem of terrestrial magnetism in the southern hemisphere, and that all civilised nations would unanimously point to that individual who has already planted the “red cross of England” on one of the northern magnetic poles, as the officer best fitted to be the leader of an expedition sent out for such a purpose. Under a deep and abiding conviction, said the author, that our country’s future glory is identified with the encouragement of British enterprise, and that she would lose her high national character by ceding to another this opportunity of completing this work, first traced out by Cook, I could not refrain from recording my sentiments; and conclude with the ardent hope that, through the exertions of the British Association, our wishes may be realised; and that, ere long, the southern cross may shine over an expedition sailing to the Polar seas—that cross, sung by Dante and Camoens of old, which has served as a banner in a far more sacred cause—that cross which, by its position, points out the time of night to the Indian wandering o’er the pathless desert of Atacama, or the mariner ploughing the trackless ocean—that cross which brightly shone o’er Diez, and Columbus, and Vasco de Gama—and that cross which, I earnestly trust, will once again shine o’er the meteor-flag of England, proudly waving o’er Antarctic land, discovered by the zeal and intrepidity of British seamen.

Sir George Back said the account you have just heard, and which has been so cheerfully responded to by this crowded meeting, conveys so much of the main points of the most striking events of past enterprises—enter-

prises alike honourable to those who projected, as to those who carried them into execution—that little more seems left for me to say, than to acquiesce, which I most cordially do, in the concluding hope so eloquently expressed by the writer. We have heard, from the testimony of former navigators, that there is no physical impossibility to prevent an approach towards the Southern Pole, and though M. D’Urville, with the Astrolabe and the Zélée, has been compelled to return to the Bay of Concepcion, after a navigation of fifty-two days among ice, yet had his crew been in good health, and had his means allowed him to have remained out longer, it is not improbable that some of those extraordinary movements of the ice—which he had himself so lately experienced—might have occurred, and have opened a passage to enable him to put in execution his cherished plan. That it was not so might have been regretted, had we not an officer—and why should he not mention his name—Captain James Ross—(loud and prolonged cheering), who was both ready and willing, and in every way qualified to command in so patriotic an enterprise. He, too, would accomplish those great objects which science has in view—the establishing of the curves of magnetic dip, intensity, and variation; yet these would form but a part of the advantages which we might expect to derive from a voyage which would seem to be the birthright and the duty of a nation so essentially maritime as Great Britain. I have, therefore, said the chairman, only to add my sincere wish, that the spontaneous expression of feeling manifested by this meeting may have its weight in recommending, in the proper quarter, the speedy equipment of an Antarctic expedition.

Mr. Murchison said that he gladly embraced the first opportunity of expressing his cordial concurrence in the object of the paper which had just been read, as well as the just tribute of praise awarded to Mr. Enderby, for his spirited conduct in sending out this, his third expedition for discovery towards the Southern Ocean; and he felt certain, that if the British Association would recommend this subject with all the weight which, from their station, they were entitled to do, the great object of Antarctic discovery would be no longer delayed.

Mr. Smith proposed that this Section, being

both geological and geographical, should add a distinct recommendation to the government, in addition to the recommendation of the British Association; but Mr. Murchison explained to him that all matters of arrangement must remain with the committee, and Mr. Smith concluded by very warmly complimenting Captain Back.

Mr. Lyell then resumed the chair, and

called upon Mr. Murchison to give an account of his new map of the Silurian Region, with sections of the strata, and plates of the most characteristic fossils of that region, with which that gentleman complied, referring to those vast masses of materials which he has collected for the further illustration of this theory, so important to geology, and which, we believe, he is preparing for publication.

Mr. Murchison then proceeded to explain a

large and beautiful coloured map, with upwards of twenty illustrative plates. On the map he pointed out eight colours, each of which represented a series or a system, and bore a name indicative of the system it covered. In the course of the description, Mr. M. repeated that he had adopted the name of “Silurian,” by the advice of his friend, Mr. De la Beche, and that the term was now applied to what was formerly

termed the “transition” rocks, but which he now held to be too general an appellation for the rocks comprised in his map. One feature of these rocks was, that they were quite zoologically independent of the overlying rocks. He had occupied seven years of his life at home in this pursuit, and he hoped to be enabled to spend the next seven years of his life in researches abroad on the same subject.

Professor Phillips spoke highly in commendation of the map and its classification. Geologists would now, he said, be entitled to start from a complete work, on a well-examined district, and proceed with confidence to the examination of other districts. The Geological Section had reason to be glad that this work, so long in progress, was now completed.

Mr. Griffiths was next called upon, and entered at great length into an explanation of his geological map of Ireland. He spoke in high terms of the ordnance survey which was now going on in Ireland, from which a map was preparing on a scale of six inches to a mile, and which was one of the most complete things of the kind ever exhibited. Gentlemen’s seats, parks, farms, even houses and lanes, were described upon it. Mr. G. then proceeded to describe the map, which was very large and richly coloured; the colours each representing some peculiar geological feature, which he pointed out and described.

Some discussion ensued, in which Professor Phillips, Professor Sedgwick, and others, took part; and it was intimated that portions of the colouring of the map did not accurately represent the strata indicated by the colours.

Professor Sedgwick, in allusion to something which had been said respecting an application to government for aid, suggested that in any request which might be made, that request should be as respectfully worded as it was respectfully meant. The government had hitherto conducted themselves liberally with regard to science. He observed on the vast importance of the publication of maps, that they generally formed a mark from which geology made a new journey of discovery, and congratulated the Section on the completion of the maps now before them.

Mr. De la Beche and Lord Northampton spoke in favour of the readiness of government to aid in the prosecution of scientific pursuits.

Professor Buckland said, Mr. Murchison’s map must now be a standard work to the end of time, and he must express his high gratification that it was likely so soon to be in the hands of scientific men. He also praised Mr. Griffiths’s map, but would not go into particulars respecting either, as such comments were but ill understood in meetings like the present, and were more calculated for a lecture, or a meeting of geologists. He contended that a series of geological works should be perfected and published by the government, as was done by the United States; this would be the means of saving many thousands of pounds to individuals engaged in mining, who sometimes found, after they had spent their money in sinking for coal, that the coal was already exhausted.

A conversation then ensued between Major Portlock and Captain Washington, respecting the progress made in the government surveys in this country; which the latter thought proceeded too slowly. Major Portlock said the funds allowed for the purpose were but limited, and the officers engaged proceeded as quickly as their means would allow. The chairman observed that the government had not done so much for geography as they might have done, and in some instances government surveys were

a positive evil. He knew an instance where some private individuals wished to publish a map of Fifeshire, but a government survey was going on at the time, and they were not permitted to avail themselves of the information which it was calculated to afford. That information was shut up in the Tower, and the parties had to wait year after year for the publication of these surveys, for ten years. Major Portlock assured the chairman that no such information was withheld by government; it was at the service of any gentleman who thought proper to apply for it.

A paper, by Mr. Leithart, was then read, 'On the Composition of the Stratified Rocks of Alston Moor.' The paper contended that neither the true theory of stratification, nor a true or an improved system of stratification had yet been discovered; and suggested that it might be effected by the theory of electricity, which would explain and account for all the phenomena. The paper then gave an account of some experiments on a small scale, with which the author was perfectly satisfied. Professor Buckland said they were all much indebted for such experiments, but they did not go to explain the theory of horizontal stratification; the value of such observations was applicable to the origin of mineral veins.

An abstract of a paper by Mr. Trimmer, was then read, 'On the Occurrence of Marine Shells over the Remains of Terrestrial Mammalia, in Cefn Cave, Denbighshire,' and a discussion ensued as to the mode of their deposit, but nothing decisive was elicited. It appeared that a full paper on the subject had been printed in the Transactions of the Dublin Zoological Society.

#### SECTION D.—Zoology and Botany.

This Section opened with a paper 'On the Gemmiferous Bodies and Vermiform Filaments of *Actinia*,' by Mr. J. P. Teale, of Leeds. The author, after stating that there was among zoologists a great difference of opinion respecting the reproductive organs of the *Actinia*, proceeded to make observations on certain filiform organs closely connected with them, and described the structure of the genus. The gemmiferous bodies are about two hundred in number, and appear as elongated masses attached along the inner border of most of the leaflets. Each of them is composed of several horizontal folds or plates, and, when carefully unfolded may, by the assistance of a lens, be seen to consist of two delicate layers of membrane enveloping one closely compacted layer of gemmules. After unfolding the gemmules, the membrane layers become placed in opposition, and form the mesenteries, by which the gemmiferous body is attached to the leaflet. The vermiform filaments represent a delicate mesentery to the internal border of each gemmiferous body, and is a delicate vermiform thread minutely convoluted, forming, by its numerous convolutions, an elongated mass extending from the superior to the inferior part of the gemmiferous body. The thread is of a milk white colour, about the thickness of horse's hair, and yields to a slight pressure with a needle. The filaments, during life, exhibit a distinct vermicular motion, even for some time after they are detached from the animal; and, in the absence of any direct evidence as to their nature, the author considered them to be elongated glands of animals a little higher in the scale of organisation, and supplying secretions subservient to the digestive process. This paper had, besides a large drawing, several specimens in bottles of spirit, to exemplify the subject.

Mr. Gray complimented Mr. Teale, and said, that it was a source of delight to him to find a gentleman locally situated as he was, devoting his time to a subject which had been passed by many eminent men, and he hoped it would encourage other naturalists to take it up.

A brief paper was next read 'On the Inosculation of Trees,' by Mr. J. Wallace, with two specimens illustrative of their union.

A long and interesting paper was then read by Captain J. E. Cook, 'On the Genus *Pinus* and *Abies*, with Remarks on the Cultivation of some Species.' The author stated, that considerable interest had been excited by the introduction of various species of *Pinus* within the last few years into this country, and by the zeal and activity of our own and foreign collectors. With the assistance of wealthy individuals, they had procured about seventy species of *Abies* and *Pinus*, exclusive of junipers, cedars, and other *conifera*. The order of these species is as follows:—The first were from America, and the second (about fifteen in number) were produced in the magnificent ranges of mountains which separate the waters of the Atlantic from those of the Pacific, known by the name of the "Douglas Group," out of respect to the lamented traveller of that name. The third were from the table-lands of Mexico. The fourth was a species newly discovered on the Himalaya Mountains; and the fifth, that of Europe. Those trees from America are of every form and size, but they only produce timber of second-rate quality. The "Douglas Group" will, it is expected, be a valuable addition to our woodlands, one of which (the *Abies Douglasii*) possesses the high qualities of the larch, being durable, quick in growth, and of utility when young, with the advantages, in some respects, of being an evergreen. The author earnestly entreated all cultivators to attend to this species. The trees from Mexico are few in number, and of too recent a date to be spoken of confidently; and the Himalaya species, although few in number, would probably soon be augmented. The last, and most interesting of the whole, are those of Europe; the greater part of them being of considerable, and some of surpassing value. Mr. Cook then went into an analysis of some of the principal species, shewing their respective qualities, and, afterwards proceeded to remark upon the practicability of cultivating some species of *Pinus* on a large scale, with a view to the increase of our national resources, and to render our payment of enormous sums of money annually expended for timber in a great measure unnecessary.

A long discussion then ensued, in which Sir Charles Monck, Dr. Graham, and Mr. Cook took part, on the success and failure of various species which had been brought to this country, which at length ended by a few remarks from the president.

A paper entitled 'Remarks on the Modern Classification of Insects,' by Mr. Hope, followed.

Two papers were next read from G. B. Sowerby, Esq., of London; one 'On *Lycopodium Lepidophyllum*,' of Hooker; and the other 'On *Encrinus Fossil*.'

A paper was read from Mr. Strickland, of Yorkshire, 'On the Claims of the *Ardea Alba*, Great White Horn Eagle, to be considered British.' The author proceeded to relate the capture of one of this species in Yorkshire, which was in his possession; and then shewed, from various sources, that the bird was well known, and that several specimens were in the collections of gentlemen in the country. After a

few words from Mr. Fox and Mr. Gray, who both spoke in favour of the claims of the bird to be placed in the British catalogue, it was agreed that it should be acknowledged.

Another paper was also read from the same author, relating to the capture of a new species of fish at Burlington Quay, on the 11th of August last. The author described it to be of the shark tribe, but differing from those that have been usually met with. It was seven feet and a half in length, and three feet three inches round the girth. The skin was smooth and slimy, and on the upper part of the back it had sharp spines, but not large in size, and about one inch asunder. Its eyes were large, and hung over the mouth, and between the eyes were placed the nostrils. It was of a reddish slate-colour when taken, but assumed a redder cast before it died. The author then described the anatomy of the fish, the result of which convinced him that it was a species not hitherto met with in those seas.

Mr. Gray and Mr. Yarrell both considered it a new species; the former gentleman merely noticing that there was a fish brought from the Cape of Good Hope which resembled it very much.

#### SECTION E.—Medical.—Dr. Headlam presiding.

Dr. Yellocy proposed that the Section should apply to the Association for a grant of £51. for the best mode of making an instrument for the relief of deafness. The motion was seconded by Dr. Granville, and carried unanimously.

Professor Owen then read an elaborate and voluminous paper, 'On the Structure of Teeth, and the Resemblance of Ivory to Bone, as illustrated by Microscopical Examination of the Teeth of Man, and of various existing and extinct Animals.' The recent investigations on the intimate structure of the teeth, particularly those of Purkinje, Müller, and Retzius, were very fully detailed and discussed. Until very lately, the analogy of tooth to bone was supposed to extend only to the chemical compound in the hardening material; and the arrangement and deposition of this matter was thought to differ from that of bone, and to correspond with the mode of the growth of hair, which, in their general vital properties, teeth much resemble. Their apparent laminated structure, observed during the progress of decomposition, the supposed proof, was equally applicable to true bone; and the appearances presented by the superficies of vertical sections of teeth were due, not to the interval of separate and super-imposed laminae, but to the diffraction of light caused by the undulation of a series of parallel tubes proceeding in a contrary direction to the supposed laminae. This apparent structure, however, is not constant nor equally plain in different teeth. We need not follow the learned professor through his notices of the experiments of Müller on the dental tubuli, nor through his analysis of the microscopical observations of Retzius, with reference to the intricate arrangement of the tubes and cells. And our space will not allow us to describe his illustration of the analogy subsisting between tooth and bone by his own highly interesting and numerous observations on the structure of recent and fossil teeth. With reference to the application of the tubular structure of teeth to the explanation of their pathology, Professor Owen remarked, that nothing has yet been done; that it was a new and fertile field which would, doubtless, yield interesting results, and might suggest practical improvements in dental surgery. Through the endless variety in the

teeth of different animals, the general law of the tubular structure could be unequivocally traced, and a nearer approximation of the substance of the tooth to that of common bone was observable in descending from man to the lower classes of vertebrated animals. Numerous sections of the teeth described, prepared for microscopic examination, were exhibited to the committee.

The next paper was 'A Brief Notice of the amount of Air necessary for Respiration,' by Dr. D. R. Reid, some details of which he submitted to the Section. The usual mode of making experiments of this description was, by confining number of persons in a room with a limited quantity of air. One of his experiments was upon a single individual; another, upon sixteen or seventeen persons; and a third, in an apartment of eighteen feet broad, thirteen long, and twelve high, upon 100, and the greatest number, 244. As the doctor's experiments in ventilating the House of Commons have made the subject pretty generally known, we shall only state, that the lowest supply admitted at any time was 36,000 feet per minute. Some questions were put to Dr. Reid, as to the quantity of air necessary under different circumstances, one of which was to clothing, which he said he believed to be of the utmost importance. The air should have access to every portion of the skin, and the more lightly clothed a person was, he would be better able to go through any fatigue. In answer to a question from Mr. John Fife, the doctor said, when a person was under any degree of excitement, it made the greatest possible difference; and noticed instances in the House of Commons, where the temperature fitted for a man about to address the house, was totally unfitted for him afterwards. [We trust our parliamentary orators will remember this when they come to need their second wind.]

As the Geologists had a touch of lunar astronomy, so had the Doctors a dose of phrenology foisted into their Section; and hardly has that science made a more absurd appearance since Tony Lumpkin practised it upon Crackskull Common.

Dr. Inglis produced a skull which he informed his hearers was the identical caput of Eugene Aram, who enacted the schoolmaster abroad so many years ago that he might have been forgotten but for his own memorable defence, the touching poem of T. Hood, and the admirable tale of Sir Edward Lytton Bulwer. On the present exhibition, the learned Doctor set to work with the rather necessary preliminary, considering the argument about to be drawn from this "Palace of the Soul," to prove that this was really and truly the ex-gibbeted head of Eugene Aram, taken from the gallows near Knaresborough, where the murderer was hung in chains. He told us that it was cut off by Dr. Hutchinson, who had a fancy for relics of the kind; and, after the doctor's own head had become a *caput mortuum*, his widow handed over the precious inheritance to her second husband, a surgeon in York. He sent it for Spurzheim's inspection, together with the skull of an abbot, executed, for resistance to his spoliations, by Henry VIII. as the story has been before related; and Spurzheim decided that it was the head of a female, though possessed of Eugene Aram's organs. This was unlucky; but, by exhuming a skeleton from the spot where Aram was said to be buried, and discovering no head there, this negative was construed into a positive proof (stronger than even Spurzheim's opinion), and it was maintained to be the very head, without

doubt or question, which phrenology demanded. "The doctor (continues the 'Newcastle Journal,' after intimating these facts) then entered into a review of the circumstances under which the criminal was condemned, having this object in view, that, as the evidence was circumstantial, and did not clearly establish the proof of his guilt, after an examination of his head upon phrenological principles, he should be deemed not guilty of the crime for which he suffered. He said, if he had been found guilty at all by a jury of the present day, it would under no circumstances have been of murder, but of manslaughter." This startling proposition, implicating an honest and conscientious jury in the guilt of a false or mistaken verdict, so long after they had done their duty to their country, and between Heaven and the prisoner at the bar, was examined with becoming gravity; and we almost expected to hear a motion for the publication of their names, and their being branded to all posterity as persons so profoundly ignorant of phrenology as to have committed a most cruel legal murder. Dr. Inglis, however, stopped short, and

Dr. Granville remarked, that Dr. Inglis wished to prove, by phrenological observations and inductions, that the individual whose character he had developed, suffered rather unjustly. Now, a most important question was, whether the doctor was prepared to state, more distinctly than he had hitherto done, the precise nature and identity of the skull. In giving the identity of the skull, the doctor had read too low and too fast, and he suggested that he should again give the statement in an oral manner. He (Dr. G.) did not admit the propriety of bringing forward questions of this description, but as it had been brought forward, he did not wish to prevent the discussion.

Dr. Inglis then repeated his statement, which he thought perfectly satisfactory.

Dr. Granville again suggested the expediency of giving clearer proof touching the skull in hand (which was, indeed, a very neat and well-shaped skull), and thought it possible that, taken out of Dr. Hutchinson's large and valuable collection, his widow might make a mistake in transferring it to her husband No. 2.

Dr. Inglis replied, that No. 2 was as well acquainted with the skull as Dr. Hutchinson himself, as he was his assistant before he married his widow.

Some more nonsense was talked upon the subject, when (as the "Journal" reports),

The chairman observed, as to the dispute about the identity, that that which might be moral evidence might not be legal.

A gentleman said, the object of the writer was to shew that the evidence acquired from anatomical examinations was enough to turn the evidence in doubtful criminal cases; and he related an anecdote which occurred in France, which bore particularly upon the circumstance.

Dr. Knott said, the question would be, Was phrenology a true science? He was pleased with the paper. The motive, to be sure, was amiable, to do whatever we could that posthumous justice might be rendered to those who had been ill-treated. He perfectly agreed with every word Dr. Granville had said as to the identity. It was perfectly impossible that this skull could be identified. He considered that an anatomist would not swear to it if it had been long in his possession with other skulls. He further expressed himself unfavourable to the principles of phrenology.

Dr. Fife agreed with Dr. Granville, that dis-

cussion was unnecessary as long as there was a doubt as to identity. The chairman had very properly said, there was a difference between moral and legal evidence; but he agreed with Dr. Knott, that, in this case, the evidence was neither moral nor legal. They had been informed that the skull had been sent to Dr. Spurzheim, but where was the evidence that the same skull had ever been returned? As to opinions upon the skull, on the justice of the sentence he would say, that he considered it belonged to a person who ought not only to have been condemned, but who ought not to have been answerable.

A member asked, What time the skull of Eugene Aram was removed from the gibbet, and if it was a recorded fact that it was so?

Dr. Sargeant did not consider the discussion calculated to lead to any result, for they would just go from one debatable question to another.

Dr. Hindmarsh, who stated he had considerable experience as an anatomist, said, he would almost pledge his honour that this could not be the skull of Eugene Aram. It appeared to be the skull of a male person not above thirty years of age; and Eugene Aram was fifty-four at the time he suffered.

A gentleman, who also stated he was an anatomist, would put it to Professor Owen, Whether it was possible to judge of a person's age within ten years? He considered it was not fair to require legal evidence in a philosophical discussion.

Mr. Simpson detailed the circumstances under which he had examined the skull, at the request of Dr. Inglis. He considered it was the skull of a person very likely to be a criminal character; and he had declared his opinion that he would be a dangerous man. If they had to judge by the skull, it was sufficient to condemn him. He (Mr. Simpson) was not responsible for a verdict of murder or of manslaughter; but he would say, that if a blow was given on the head, it was likely to come from the person to whom the skull belonged.

Professor Owen said, his opinion was, that it was the skull of a middle-aged man.

Dr. Inglis said, he would make one remark with regard to the identity. A gentleman had stated that there was no proof that the skull had been returned by Dr. Spurzheim; but the Rev. Mr. Dalton knew it to be the same. If the evidence he had adduced was not regarded as satisfactory, he could do no more.

After a few words from the chairman, the thanks of the Section were given to Dr. Inglis; and they then adjourned from this most unprofitable debate.

The phrenologists, as our readers will remember, tried to get up a section of their own at Dublin, where they met on the Monday after the meeting, and bandied about the skulls of Dean Swift and Stella. Since then they have been quiet; and it was only by a side-wind that they managed this ridiculous episode to bring the Medical Section into lower repute than it has in the Association: and, to confess the truth, that was unnecessary. We do not mean to say that able men and important inquiries do not distinguish this branch of science at these meetings, but, from the very nature of the profession and its pursuits, it is next to impossible that any striking results can proceed from their casual annual collision.

#### SECTION F.—Statistics.

An 'Account of the Changes in the Population of New Zealand,' written by Saxe Bannister, Esq. was read by Dr. Taylor. The

author spoke highly of the physical and intellectual energies of the New Zealanders, and their capabilities of civilisation, and urged the importance of establishing some form of government among the inhabitants, under the auspices of this country.

We have, however, so lately gone into the minutiae of this subject, and are still continuing it in our unfinished review of Mr. Polack's volumes, that it would be sad repetition to occupy space with it under another title. We perfectly agree with the conclusion, which was generally adopted in the Section; viz., "that the time had arrived for the establishment of a settled government in New Zealand."

We may add, that Dr. Bowring alluded to a gentleman of the name of Busby, who, he said, had effected great good in Australia, in a most unobtrusive manner, and owed his present appointment to no other influence than that of his high character. It was the opinion of this gentleman that knowledge and civilisation would gradually make their way in New Zealand. He might mention, though it was not exactly relevant, that on the skirts of Egypt he (Dr. Bowring) had recently met with Bedouin Arabs, who had taken land, and were settling upon it as cultivators of the soil. On entering into conversation with these children of the desert, they informed him that they perceived the time for their abandonment of savage life had come, and it was their opinion that it would be more to their interest and comfort to live as farmers than as robbers.

Mr. Rawson read a paper 'On Fires in London,' which he stated to have been prepared from authentic sources. In the last five years, there had been (exclusive of ignited chimneys) 2476 fires in the metropolis, or 495 per year. In 5 per cent of these fires the premises were totally destroyed; in 25 per cent they were seriously damaged; and in 68 per cent the injury was slight. The smallest number of fires occurred on Saturdays, and the largest on Fridays. "Fryday," said a member, "is a very appropriate day." [As in the House of Commons, every poor joke creates a laugh in philosophical assemblies.]

The fewest fires (continued Mr. Rawson) occurred from five to nine o'clock in the morning; and the greatest number from ten to two in the night. Thus, the return for the five years shewed that 98 broke out at five in the evening; 105 at six; 122 at seven; 182 at eight; 188 at nine; 199 at ten; 197 at eleven; 165 at twelve; 129 at one; 113 at two; 80 at three; 68 at four; 50 at five; 47 at six; and so on. With regard to the causes of fires, the details were most instructive. The number in five years, he had already stated, was 2476. Of these, only 165 were traceable to unavoidable accidents. 594 occurred through the incautious use of candles; 72 from palpable carelessness in various ways; 29 from children playing with fire; 20 from fires kindled on hearths, and in other improper situations; 330 from choked flues; 17 from incendiary communications in the buildings; 44 from over-heated furnaces; 153 from sundry accidents with gas; 7 from intoxication; 31 from arson; 14 (in two years) from the ignition of wearing apparel; and 131 (in three years) from clothes being carelessly left to dry at the fire. The firemen of London stated that they could much oftener succeed in staying the ravages of fire, if party-walls were built in all cases when houses were erected.

Mr. Felkin remarked, as a curious fact, that in the midland counties fires were comparatively rare; while in the West of England they were of frequent occurrence. The contrast

was, doubtless, attributable, in some degree, to the circumstance, that in and around his place of residence (Nottingham), plaster floors were common, and thatched houses rare; while in the West thatched roofs were general.

Sir Charles Lemon knew a village in Devonshire, formerly composed of thatched houses, which was periodically destroyed by fire, till thatching was discarded. In Cornwall, where the houses were slated, fires were uncommon.

Mr. Rawson would be glad if his paper should lead to the collection of statistical details on this subject, and a diminution in the number of fires.

Mr. Porter believed that gas was often blamed for fires very innocently. When it was difficult to discover the cause, the poor gas was charged with the accident. Gas, he suspected, was often resorted to by wilful fire-raisers. This might easily be done, with slight risk of detection; and he suggested, as a preventive, that gas-fitters should use copper pipes in houses, instead of lead.

The Rev. W. Turner said, that it was shewn, in Mr. Rawson's paper, that the greatest number of fires in London occurred an hour or two before and after midnight. Might not the practice of raking out the fire at bedtime have some connexion with these conflagrations? In Newcastle, fires were unfrequent, owing, perhaps, to the abundance and cheapness of coal in the district. The people of Newcastle did not think it worth while to rake out their fires at night.

Col. Sykes (the chairman) thought the fire discussion was about out, and he would, therefore, call upon Mr. M'Alister to read the next paper.

Mr. M'Alister, accordingly, read a notice of the Blind Asylum at Newcastle, projected in autumn last and opened in June, and the mode adopted for instructing the blind. We have so frequently described this process, or, indeed, the rival processes, that we shall leave the question to their superior utility to its worth as far as it goes.

Col. Sykes observed, that it was one of the most touching acts of benevolence, to endeavour to remedy by art the defects of nature; and he was glad to hear that a Blind Asylum had been added to the many other excellent institutions of Newcastle.

#### SECTION G. — Mechanics.

Mr. Ferrier, of Liverpool, at the request of the president, announced the arrival at Liverpool, from America, of a small steam-vessel, which had made the passage of the Atlantic both ways. The vessel was about 640 tons burden, and 246 horse-power. She left Liverpool on the 5th of July, and soon after, encountered very heavy western gales; notwithstanding, she reached New York on the 24th, having completed her voyage in eighteen days and a half. She left America on the 5th of August, and reached Liverpool on Sunday last, bringing New York papers to the 27th ult., besides despatches, &c. from Lord Durham. A quantity of resin was burned with the ashes during the voyage, and the new compound fuel was used for generating heat. The account was received with considerable applause, as, indeed, are all communications on the interesting subject of long steam voyages.

The next paper was a 'Description of an Improved Mode of constructing a Railway,' by Mr. Price. The road having been formed level and solid, stones properly prepared are to be placed in a continuous line; a groove is cut in the stones to receive the rails, and where the chairs are to be fixed. The chairs are

made fast to the rail by a bolt which is merely slipped in, and are sunk into the stone until the top part is even with the top of the stone, to which the chairs are fastened by two small wooden pins. The chairs to be placed from ten to four feet apart. The rail in this improved mode, should weigh 50lbs. per yard, the chair 14lbs. if of malleable iron, and 20lbs. if cast iron. Should a shrinking of any of the stones take place, this might be remedied by removing the soil from the stone, and introducing two or more wedges to raise the stone, when it might be secured as before.

Mr. George Stephenson stated, that as high embankments were liable to subside very greatly, nothing was even so good as cross sleepers, and that they could not be raised and kept in repair without stopping the passage.

Mr. Price observed, that when the embankment had become consolidated the wedges could be applied.

The next was 'On Cast-Iron Sleepers as a Substitute for Stone, with continuous Timber Bracing,' by T. Motley. The sleepers are made of iron of a triangular form, and hollow, to save the expense of the metal. The base of the sleeper is attached to the rail transversely, the apex pointing downwards. The timber passes longitudinally through the centre of the sleeper, to which it is attached by wedges of iron and wood.

Mr. Stephenson observed that the plan was too expensive, and that it did not combine the proper requisites for a proper system of railway laying.

Mr. Herapath explained the model which accompanied the description at some length.

Mr. Donkin remarked, that a certain portion of elasticity was requisite for a good railway way.

Mr. Vignoles stated, that it appeared to him to be Mr. Reynolds's plan cut into pieces. He also explained the principles of laying railways on longitudinal timbers, which were found to answer most completely on the Dublin and Kingstown railway, where a portion had been so laid for three years, and had not cost 20*l.* for repairs. The advantage of this plan was, that it gave a smoother surface for the rail to pass over, and also that degree of elasticity to which Mr. Donkin had alluded as necessary for perfection in railways.

A machine for raising water by means of a hydraulic belt was then described by Mr. Hall. This machine, of which a model was exhibited, consists of an endless belt passing over two rollers, the motion being communicated by means of a handle attached to the axis of one of the rollers.

Mr. Hawkins said the plan was old; he had seen a similar machine in use fifty years ago, which differed only in having a rough horse-hair band instead of that in the model.

Mr. Donkin said, without entering into the question of priority of invention, he might observe, that he had seen a machine of this description working up water from a depth of 130 feet, with a beneficial effect of seventy-five per cent of the power; the general beneficial effect of ordinary pumps being about sixty per cent.

A dry Gas Meter was next brought forward. This instrument consists of a pulse-glass, that is, two thin glass globes united by a tube. These globes are partially filled with alcohol, and hermetically sealed when all the air is expelled from their interior. In this state, the application of a very slight degree of heat to one of the globes will cause the alcohol to rise into the other. The pulse-glass is fixed on an

axis having a balance-weight projected from it, and the axis works in bearings on the sides of a chamber through which the gas to be measured is made to pass the gasometer in two currents, one of which is heated and the other cold. The hot gas is made to enter opposite to, and to blow upon the top globe of, the pulse-glass, while the cold gas blows upon the other one. The difference of temperature thus established between the globes causes the alcohol to rise into the upper one, and the glass turns over on its axis, thus varying its position, and bringing the full globe opposite to the hot stream of gas. This stream, with the assistance of the cold gas, which condenses the vapour in the top globe, repeats the operation, and the speed at which the globes oscillate will be precisely in proportion to the quantity of gas which has been blown upon them, provided a uniform difference of temperature is always maintained between the two streams of gas. The reporter proceeded to describe the mode of procuring this uniform difference of temperature; but the machine, of which a model was exhibited, is so complicated, that we cannot attempt to follow the explanation.

A long discussion followed, during which several objections were raised by several scientific men. Mr. Liddell observed, during the course of the discussion, that a flame consuming one-fifth of a cubic foot of gas per hour would burn in a chamber, and not be liable to be extinguished by the opening and shutting of doors; and that, if due precaution were used, a flame might be preserved at a consumption of one-eighth or one-tenth of a foot per hour.

A paper 'On the Construction of Geological Models,' by Mr. Sopwith, came next. The plan recommended by Mr. Sopwith for the construction of geological models, and which was employed by him in constructing a model of Dean Forest, was as follows:—The plan of the district was divided by lines crossing each other at right-angles, and at the distance of a mile from each other. A vertical section was then prepared, corresponding with each of these lines. These sections were drawn upon thin pieces of wood in the ordinary manner of a vertical geological section, and the several pieces of wood were then united by being half-lapped together, forming a skeleton model of vertical sections. After being thus united, the several sections were taken separately, and cut into as many portions as were required to illustrate the successive layers of strata; the intersection of each of these portions having been first marked by a number at the several corners. After each section had been divided into its several parts these respective portions were again united, and formed the exterior boundary of a square mile of rocks. The interior of this was filled with wood and carved so as to coincide with the sections. Any intermediate portion could be fitted with great exactness, first by a thin or skeleton section, and, afterwards, by wood, which any workman could carve with the most exact accuracy as quickly and as surely as any ordinary mechanical operation; and thus, at once, a connexion between the most complicated section and the art of a common workman was accomplished. The outline of the surface and the general contour of the country are obtained partly by means of the skeleton sections, and partly by the use a gauge or graduated pencil sliding in a frame, in the same manner as practised by sculptors in transferring the dimensions of a cast to a block of marble. This mode of constructing geological models, Mr. Sopwith observed, was, so far as he was aware, entirely new.

A description of an improved levelling staff, for subterraneous as well as surface levelling, was produced by the same ingenious mechanician. The method of reading the figures of the staff itself, instead of the sliding vane, as adopted by most experienced engineers and surveyors, is used in Mr. Sopwith's improved staves. The figures are engraved on copper plate, on an enlarged scale, as to contract in drying to their proper length, which is fixed by a very accurate gauge. The arrangement of the scale is that of feet, divided into hundredths, alternately black and white, and in the form of the figures' clearness and distinct vision at a distance is chiefly aimed at. Mr. Sopwith's improvement consists in the mechanical arrangement of the slides, which are held in any fixed position by means of a catch or spring. The stave for mining purposes has also an entirely new arrangement. It has a glass shield, or cover, to protect the face of it from wet and dirt, and is hinged so as to work in any seam of from three to five feet, but the principle may be adopted for any greater or less extent.

Mr. Webster observed that two modifications of the instrument had been suggested by Mr. Brough. The first was that the staff should be placed on a piece of iron, and united to it by a universal joint, so that it might be reversed, or turned in any direction without danger of being disarranged. The second was to invert the figures, so that when seen through an inverted telescope they might appear erect.

Mr. Donkin said that he, also, had suggested similar improvements, but he found that, practically, they were not of much use.

Mr. Herapath remarked, that the scale of division was not sufficiently minute for purposes where a great degree of exactitude was required.

Mr. Vignoles said the instrument met with his highest approbation.

Mr. Sopwith replied to the observation of Mr. Herapath, by observing that the instrument was intended for purposes which were almost of constant occurrence, and not for the particular cases to which Mr. H. had alluded. The instrument, however, might be graduated to any extent.

The following are brief notes of the remainder of the sectional proceedings:—

Description of a suspension bridge, designed and erected over the River Avon, Tewerton, near Bath, by T. Motley. The extreme length of the bridge is upwards of 230 feet; breadth of the roadway, 14 feet; and it was completed at a cost, including the towers and land abutments, &c. of under 2400. A paper, giving a minute description of the several parts was read, but we have not space to insert the whole, and a condensed account would be imperfect.

A model and plate of Dredge's suspension bridge was exhibited, and a description of it read. Its peculiarity consists in tapering suspensors and diagonal braces. Some discussion took place, but nothing really important was elicited.

Description of a steam-engine boiler, employed at the Gateshead Glass Works, by Mr. Price. The principal advantages of this boiler are the impossibility that either flues or boiler can collapse, its small consumption of fuel, and the rapidity with which it generates steam. Mr. Price gave a verbal description of it, but no discussion followed.

Machine for pumping leaky vessels at sea, by Mr. Dalziel. The instrument is worked with a piston similar to a common pump, the motion being communicated by the stream of

the water, when the vessel is sailing, operating upon paddle-wheels, at each side of the vessel.

A Gunter's scale and several other small models were exhibited, but no description of them was given in the Section.

The Section then adjourned; Mr. Babbage left the section-room before the proceedings terminated, and Sir John Robinson presided during his absence.

The promenade in the Green Market terminated this busy day. It was quite unique: fitted up with wreaths of evergreens and flowers; and the immense space filled by philosophers of every class and quality. They, as well as the townspeople, seemed greatly to enjoy the scene.

#### FINE ARTS. NEW PUBLICATIONS.

*Sketches on the Continent.* By T. M. Richardson, Jun. M'Lean.

THESE Sketches are dedicated, by permission, to Her Grace the Duchess of Northumberland, and exhibit views in Italy, Switzerland, France, &c. &c. When a portion of this work met our notice, in April last, we thought and spoke highly of the talents of the young artist; and our expectations, now that the volume is completed, are amply fulfilled. The subjects, twenty-four in number, besides the introductory frontispiece, rise in interest from their novelty and variety, as well as from the excellence of their execution in the lithographic department of art; the credit of which must be divided between our young artist and Mr. J. B. Pyne. Nor must we omit to mention the admirable way in which the volume is got up.

*Hints on Light and Shadow Composition, &c. as applicable to Landscape Painting.* Illustrated by Examples. By Samuel Prout, F.S.A. and Painter in Water Colours in Ordinary to Her Majesty. London, 1833. Ackermann.

OUR pages have ever borne testimony to the talents of this very able and indefatigable artist; and we have now before us the result of his practice and experience in the present volume, to which we give our unqualified approbation, well knowing that to all who have taste and power to appreciate what is excellent in art, the book will recommend itself. Mr. Prout modestly offers his book in aid of the juvenile aspirant in drawing; but we are much mistaken if it will not be found useful to professed artists, as well as to amateurs. His theoretic remarks will lead both to consider certain qualities of art essential to effect; and to look for those qualities whenever they occur in nature or in the works of the experienced painter.

It will be found in the abundant examples exhibited in the work, that the artist himself has considered and acted upon the axiom, that "example is beyond precept." The plates are twenty in number, and include not less than eighty examples, illustrative of the qualities of light, shadow, and composition; nor have any pains been spared to give its luminous contents an external appearance worthy a place in the best furnished library.

*The Oriental Portfolio.* Dedicated, by Permission, to Her Majesty. A Series of Illustrations of the Scenery, Antiquities, Architecture, Manners, Costume, &c. of the East, from Original Sketches. The Literary Department under the Superintendence of Prof. H. Wilson. 1833. Smith, Elder, and Co.

VIEWS from a far country, like news from a far country, are doubly dear; and when, as in

the present instance, they come recommended by taste and talent, they cannot fail in attracting public attention. Although the labours of the Daniells (uncle and nephews) have pictorially brought nearly all India under our view, yet the present, and, we doubt not, the future portions of this work, will shew that an abundant field is left both of novelty and variety. In the treatment of the subjects, the pencils of Lieut. Bacon, Stephanoff, and others, have been skilfully employed.

## DRAMA.

*Haymarket.* — A petite comedy, called *A Lesson for Ladies*, written by Mr. Buckstone, was produced at this house on Wednesday evening. The plot is very French, and some of the situations are novel and well managed: the dialogue, though not particularly pointed, is animated and agreeable. Mr. W. Lacy, Mr. Webster, Mr. Buckstone, Mrs. Glover, Miss Taylor, and Mrs. Fitzwilliam, sustain the principal parts with ability and spirit — the last-mentioned lady's execution of a *buffa scena*, composed by Blewitt, is extremely clever, but rather of the longest. We make all due allowance for the delays, imperfections, and uncertainties of a first representation, and feel sure that, when slightly curtailed in some scenes, and trimmed in others (as the afterpieces at this theatre generally are\*), this little comedy will become a pleasant variety amongst the many light and amusing trifles now acting.

*New Strand Theatre.* — On Monday, and during the week, a burletta, by Moncrieff, called *Up and Down, or the Road of Life*, has been played with great and merited success: it belongs to the class of pieces which have been so popular at this little theatre. The plot is amusing; the scene is laid between Windsor and London, and the Taglioni coach plays a principal part: better ground for a fair "show up," we need scarcely say, could not be chosen. A portrait, or two, will be easily recognised by such of our readers who will, upon our recommendation, visit this theatre. We shall only add, that the characters are well drawn, and most cleverly acted, sung, and danced; the slang is inoffensive, the dialogue humorous, and the scenery excellent. The progress of the Taglioni, in the last scene but one, is amongst the most ludicrous things we have ever witnessed on the stage. We have said all the characters were cleverly supported; we should have mentioned those intrusted to Miss Daly, Messrs. A. Lee, A. Younge, and Hammond, as most eminently so.

## VARIETIES.

*Monument to Lord Collingwood.* — We are glad to see memorials, the productions of the fine arts and the best ornaments of a civilised country, raised and raising in honour of distinguished men, in many parts of the kingdom. Those in London, to Nelson and Wellington, will proudly adorn the capital; and in the provinces, the example is fitly followed. A colossal statue of the Duke of Sutherland is about to be placed in a conspicuous situation on his vast Highland territory; and in Newcastle (just adorned by the statue of Earl Grey), a meeting of the nobility, gentry, and clergy of the town and surrounding district, has commenced a liberal subscription to do honour to the eminent services and virtues of Lord Collingwood, the faithful friend and

brave associate of the hero of Trafalgar. Vice-Admiral Sir C. Ogle was in the chair, and the three resolutions were moved, with very animated remarks, by Mr. M. Bell, and Mr. H. Hinde, M.P.s., Mr. Blackett, M.P., Mr. C. W. Bigge, Mr. Ingham, M.P., and Mr. J. Graham Clarke. Captain West read an interesting letter from Lord Collingwood, giving a description of the battle of Trafalgar; and mentioned that he received his education at Newcastle grammar-school. It is full time that Newcastle and the north of England should shew their grateful sense of the glory his birthplace reflects upon them; and we have no doubt but a noble monument will be erected. The northern part of the town offers a splendid site for any striking work of sculpture. Their own great artist, Lough, was a visitor at the meeting of the Association: he is the individual to illustrate this design.

*Honour to whom Honour is due.* — On Monday last, the master and brethren of the Trinity House, presented, in silver boxes, the freedom of their corporation to Capt. Sir George Back, R.N., and Captain J. C. Ross, R.N. The following are the inscriptions on the boxes: —

"Presented by the master, pilots, and seamen of the Trinity House of Newcastle-upon-Tyne, with the freedom of their corporation enclosed, to

*Captain Sir George Back, R.N.*

as a testimony of their approbation of the persevering and successful efforts in the cause of science and humanity displayed by him in his various expeditions to the Polar Seas. 27th of August, 1839."

"Presented by the master, pilots, and seamen of the Trinity House of Newcastle-upon-Tyne, with the freedom of their corporation enclosed, to

*Captain J. C. Ross, R.N.*

as a testimony of their high approbation of his voluntary services in the cause of humanity, rendered by his endeavour to rescue the crews of the different whaling ships enclosed in the ice during the inclement season of 1837. 27th of August, 1838." — *Newcastle Papers*.

*Newcastle Improvements.* — Mr. Grainger's improvements have elicited universal admiration from the numerous strangers who attended the meeting of the British Association during the last week. We understand that Mr. Grainger had the honour, at the request of her grace, of submitting his designs to the Duke and Duchess of Northumberland, who expressed their admiration of the magnificent structures he has erected in so short a time; and, in token of her approbation, the duchess condescendingly presented Mr. Grainger with a handsome gold pencil-case, surmounted with an amethyst, and containing the pencil that she had herself been using. Among the distinguished individuals who have inspected Mr. Grainger's plans, at his office, we may mention Charles Barry, Esq., architect for the new houses of parliament; Sir John Herschel, Professor Whewell, Oliver Lang, Esq., naval architect of her majesty's dock-yard, Woolwich, &c. &c., all of whom seemed to take the deepest interest in the gigantic undertaking, and bestowed upon Mr. Grainger their highest commendations, as giving, by his example, an impulse to the improvement of the street architecture of the kingdom. — *Idem*.

*Newcastle Botanical and Zoological Gardens.* — A public meeting of the inhabitants of this town and the vicinity was held on Tuesday, for the purpose of adopting measures for establishing a Botanical and Zoological Garden in this neighbourhood. The right worshipful the Mayor of Newcastle presided; and, after suitable addresses from Mr. Hinde, J. Carr, Professor Phillips, and Mr. A. Donkin, &c., resolutions were agreed to for carrying the design into effect. Mr. Grainger, the architectural Augustus of Newcastle, offered grounds, admirably adapted for the purpose, at Elswick, on

the most advantageous conditions, as a site for these gardens.

*Village Magazine, No. I.* (London, Tyas.) — A new sixpenny monthly periodical: the Number before us seems to be compiled with considerable judgment.

*Alfred de Rosan, No. I.* (London, Sherwood and Co.) — Mr. G. W. M. Reynolds has been tempted, by the success of "Pickwick Abroad," to publish a second work in the same form: the first Number is before us; but we shall wait the progress of the work before we pronounce an opinion of its merits.

## LITERARY NOVELTIES.

## LIST OF NEW BOOKS.

The French Student, by Professor G. J. Bentinck, A.B., Third Thousand, 12mo. 3s. — Analytical Tables for General and Forensic Chemistry, by M. H. Lynch, M.D., 2 sheets folio, 2s. — Extracts from the Third Report of the Inspectors of Prisons, (by authority), 8vo. 6s. — Richardson's Descriptive Companion through Newcastle-upon-Tyne, 12mo. 2s. — The Coronation, a Poem, by R. Rose, 8vo. 1s. — Ellis's Tariff, for 1838 and 1839, 12mo. 5s. 6d. — Hear the Church, by W. Hancock, Fourth Edition, f.c.p. 2s. 6d. — The Act for the Abolition of Arrest for Debt, with Copious Notes, and an Index, by R. Lush, Esq., 12mo. 5s. — The Elements of Political Economy, by F. Wayland, Esq., 18mo. 2s. — Readings in Natural Theology, 12mo. 5s. — Schenning, by C. Godwin, 18mo. 2s. — Retz's Fancies and Truth, Six Plates, oblong 4to. 10s. 6d. — Colburn's Modern Novelist, Vol. XIV. (Sayings and Doings, Second Series), 12mo. 6s. — Bourne's Lithographed Drawings on the London and Birmingham Railways, Part 1, folio, 12mo. 1s. — Memorials of Greece, 3 vols. 8vo. 1s. — Letters on the Writings of the Fathers, by Mispacanthus, crown 8vo. 6s. 6d. — The New Law for Abolishing Imprisonment for Debt, with Notes, by W. Theobold, 12mo. 5s. — The Order of Baptism, by T. M. Fellow, 12mo. 7s. 6d. — Recollections of a Minister, by Rev. T. Barr, post 8vo. 3s. 6d. — Sermons and Outlines of Sermons, edited by Q. W. Morris, 12mo. 4s. 6d. — The Spas of Germany, by Dr. Granville, new edition, in 1 vol. 8vo. 1s. — A Treatise on Neuralgia, by R. Rowland, M.D. 8vo. 6s. — Jardine's Naturalist's Library, Vol. XXII. British Quadrupeds, by M'Gillivray, 12mo. 6s.; being Vol. VII. of Mammalia. — Letters from the West Indies, 1836-37, by W. Lloyd, M.D. post 8vo. 6s. — Stories on the Commandments, by F. Upcher, square, 2s. 6d.

## METEOROLOGICAL JOURNAL, 1838.

August.	Thermometer.	Barometer.
Thursday .. 23	From 51 to 64	29-07 .. 29-64
Friday .. 24	49 .. 63	29-05 .. 29-97
Saturday .. 25	39 .. 61	29-90 .. 29-94
Sunday .. 26	46 .. 70	29-03 .. 30-01
Monday .. 27	57 .. 77	30-01 .. 30-04
Tuesday .. 28	53 .. 75	30-00 .. 29-81
Wednesday 29	57 .. 64	29-70 .. 30-01

Wind, S.W. and W. by N. Except the 23d, 25th, and 28th, generally clear; rain fell on the 23d and two following days.

A brilliant meteor in the north passed just below Cassiopeia's chair on the evening of the 27th. Rain fallen, 2125 of an inch.

August.	Thermometer.	Barometer.
Thursday .. 30	From 41 to 67	30-08 .. 29-97
Friday .. 31	44 .. 70	30-08 .. 30-05
September.		
Saturday .. 1	47 .. 69	30-02 stationary
Sunday .. 2	48 .. 68	30-13 .. 30-08
Monday .. 3	49 .. 69	30-08 .. 30-13
Tuesday .. 4	39 .. 68	29-94 .. 29-76
Wednesday .. 5	54 .. 70	29-61 .. 29-44

Wind, S.W. Except the 2d and 4th, generally clear; a little rain fell on the 4th and 5th.

Edinburgh, Latitude, -51° 37' 39" N. Longitude, 3 51 W. of Greenwich. CHARLES HENRY ADAMS.

## TO CORRESPONDENTS.

To Correspondents, &c. — At this season of the year it is most expedient that all communications for the *Literary Gazette* should be sent as early as possible in the week.

We have been reluctantly compelled to postpone Mr. Buddle's interesting paper on the Newcastle Coalfield, and also a paper by Dr. Lardner.

We have read the letter of *Onyx*, two or three times, and, besides thinking it too long for our columns, at least at present, we have some doubts whether he overturns any or all of our correspondent's statements.

Colonel Nandé's lines are equally honourable to his head and heart, but more suited to a political journal than the pages of the *Literary Gazette*.

"H. T. F." is pretty, but hardly suited to our pages.

"H. R." and "Matilda," under consideration.

"H. B. S." declined, with thanks.

\* The *Artist's Wife*, for example, where Buckstone has literally made himself a capital part out of nothing.

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## ST. BARTHOLOMEW'S HOSPITAL LECTURES.—WINTER SESSION, 1833.

To commence October the 1st.

Medicine, by P. M. Latham, M.D., and G. Burrows, M.D. Anatomy, Physiology, and Pathology, by E. Stanley, F.R.S. Practical Anatomy, by Mr. Wormald. Superintendent of Dissections, by Mr. Wormald and Mr. R. R. H. Surgeon, by William Lawrence, F.R.S. Chemistry, by W. T. Brande, F.R.S., and Mr. Griffiths. Materia Medica and Therapeutics, by G. L. Roupell, M.D. Midwifery and the Diseases of Women and Children, by E. Rigby, M.D.

Summer Session, 1833.

To commence May the 1st.

Forensic Medicine, by A. J. Farre, M.B. Midwifery and the Diseases of Women and Children, by E. Rigby, M.D. Botany, by J. F. Farre, M.D. F.R.S. Comparative Anatomy, by A. J. Farre, M.B. Practical Chemistry and Natural Philosophy, by Mr. Griffiths. Clinical Lectures.—On Medicine, by Dr. Latham and Dr. Roupell, and on Surgery, by Dr. Lawrence and Mr. Stanley. Price, 1s. 6d. of Lectures, and a Statement of the Arrangements of the School, may be obtained by application at the Anatomical Theatre, or at the Museum.

## ST. GEORGE'S HOSPITAL MEDICAL SCHOOL. Session 1833-39.

The following Course of Lectures will be delivered in this School, commencing October 1st, 1833.

Theory and Practice of Physio., Dr. Macleod and Dr. Seymour. Theory and Practice of Surgery, Mr. Caesar Hawkins and Mr. G. H. Buntington. Clinical Medicine, Dr. Macleod and Dr. Seymour.

Clinical Surgery, Sir B. C. Brodie, Bart., Mr. Caesar Hawkins, Materia Medica, Dr. Seymour and Dr. Macleod. Midwifery, Dr. Robert Lee. Botany, Dr. Robert Dickson.

Medical Jurisprudence, Dr. R. Lee and Mr. Charles F. M. Cavalier. Anatomy and Physiology, Mr. Tatton and Mr. Henry James Johnson.

Practical Anatomy, with Dissections, Mr. H. J. Johnson and Mr. Henry Charles Johnson.

Anatomical Theatre at the Royal Institution, Mr. Branda and Mr. Farre.

The Introductory Address on the opening of the Hospital School for the Session 1833-34, will be delivered by Sir Benjamin C. Brodie, Bart., in the Theatre of the Hospital, on Monday, October 1st, at One o'clock, P.M.

The following Lectures will be delivered in the Anatomical Theatre in Kinnerton Street, Wilton Place.

A public Distribution of Prizes in the several Classes will take place at the termination of the Session.

Further Particulars and Prospectus may be obtained by applying to the Porter of the Hospital, to the Porter of the Hospital Museum, or at the Anatomical Theatre in Kinnerton Street.

## BOOKS PUBLISHED THIS DAY.

## IRISH RAILWAY COMMISSIONERS' REPORT. THE CIVIL ENGINEER and ARCHITECTURAL JOURNAL.—Vol. 1, No. 1, Oct. 1, 1833.

This Journal, containing the Report of the Commissioners, contains, extra, a large Improved Map of Ireland, showing all the Railways proposed by the Commissioners and private Companies; accompanied by an elaborate Review of the Report. It also contains the Drawings and Description of Suspended Bridges, about to be erected over Numerous Sounds in Ireland; and of a Canal near Cork. Price, 1s. 6d. The Civil Engineer and Architectural Archives, Reviews of New Books, numerous Communications connected with Engineering and Architecture, List of New Patents, Progress of Public Works, &c. &c.

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